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*Compilation of studies on*

**PLANNING  
MULTIPLE DISABILITY  
REHABILITATION  
FACILITIES**

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**

**Public Health Service**

**Division of Hospital and Medical Facilities**

**Washington 25, D.C.**

Permission to adapt articles  
for this publication granted by  
HOSPITALS  
Journal of the American Hospital Association

Issued previously as an unnumbered publication in 1960 under the same title.  
The Selected Bibliography has been updated for this printing.

PUBLIC HEALTH SERVICE PUBLICATION NO. 930-D-6

1963

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For sale by the Superintendent of Documents, U.S. Government Printing Office  
Washington 25, D.C. — Price 35 cents

## FOREWORD

The need for information on planning and requirements for rehabilitation facilities is evident from the large number of inquiries received by the Public Health Service. As a result, studies were undertaken to develop and to make available planning criteria for the design of rehabilitation facilities in hospitals. The information can also be adapted to the design of facilities not attached to a hospital.

Since the patient is the center of attention in all rehabilitation programming, the facilities must allow for organization of services that will contribute to his physical, social, emotional, and personal well-being. To achieve this purpose, it has been determined that the main elements for planning a multiple disability rehabilitation facility are:

- Administration facilities
- Evaluation and treatment facilities, including medical, physical therapy, occupational therapy, hearing and speech facilities, and artificial appliance shop
- Inpatient nursing units for adults and children

Also included are facilities for a prevocational training program, special education, psychological services, and medical social services.

This material reflects the experience and knowledge of authorities in rehabilitation and related fields. It is offered only as a guide which may be adapted to local needs and specific requirements for planning rehabilitation facilities.

These studies appeared as separate articles in *Hospitals*, Journal of the American Hospital Association, March 16, 1956, March 16, 1958, September 1 and September 16, 1959, and convey the general basic requirements for planning a multiple disability rehabilitation facility. The purpose of this compilation is to present the overall picture of the elements of a rehabilitation facility that will help to achieve effective rehabilitation of the handicapped person.

## ACKNOWLEDGMENT

These studies were made possible through the interest and assistance of many persons who contributed unsparingly of their time and efforts. Appreciation is expressed to all those physicians, nurses, hospital administrators, rehabilitation workers, and to the staff members of the

Division of Hospital and Medical Facilities, Public Health Service, as well as the staff members of the Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, whose assistance has been very helpful.

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January 1960

## CREDITS

The following is a list of the authors and the titles of the articles that appeared in the various issues of *Hospitals*, Journal of the American Hospital Association. This publication is compiled and adapted from the texts of the articles.

1. "Rehabilitation—a doctor's viewpoint"  
H. Worley Kendell, M.D.  
(30:6:39-43, March 16, 1956)
2. "Planning multiple disability rehabilitation facilities"  
John W. Cronin, M.D., and Thomas P. Galbraith  
(30:6:47-54, March 16, 1956)
3. "Recommended hospital facilities for readjustment to a world of sound"  
Thomas P. Galbraith and Peter N. Jensen  
(32:6:45-49, March 16, 1958)
4. "Here's help in planning hospital operated orthopedic shops"  
Thomas P. Galbraith and Peter N. Jensen  
(32:6:56-57, 132, March 16, 1958)
5. "Elements of a multiple disability rehabilitation facility—Parts I and II"  
Jack C. Haldeman, M.D., and Thomas P. Galbraith  
(33:17:56-61, September 1, 1959  
33:18:42-48, September 16, 1959)

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## THE REHABILITATION PROGRAM

**T**HE TERM "rehabilitation" is used to include all the medical, psychological, social and vocational services whereby a person suffering from a disease or residual injury is taught to live within the limits of his disability, and if possible, to work. A rehabilitation program includes physical medicine, psychosocial adjustment, and vocational evaluation and retraining in an attempt to achieve the maximal function and adjustment of the individual and to prepare him physically, mentally, socially and vocationally for the fullest life compatible with his abilities.

Public Law 482 (83d Congress) which amended the Hospital Survey and Construction Act (Hill-Burton) made provision for Federal funds to be allotted on a matching basis for

the construction of a comprehensive type of rehabilitation facility. This amendment authorizes appropriations for grants to States for surveying needs, developing construction programs and for aid in the construction and equipment of nursing homes, diagnostic or treatment centers, hospitals for the chronically ill and rehabilitation facilities. Also, in 1954 the Vocational Rehabilitation Act was amended to authorize appropriations for grants to States to improve and expand services for the rehabilitation of the disabled.

A "rehabilitation facility" is defined in the Public Health Service Regulations relating to Hill-Burton grants for survey, planning, and construction of hospitals and medical facilities as:

"A facility providing community service which is operated for the primary purpose of assisting in the rehabilitation of disabled persons through an integrated program of medical, psychological, social and vocational evaluation and services under competent professional supervision. The major portion of such evaluation and services must be furnished within the facility, and the facility must be operated either in connection with a hospital or as a facility in which all medical and related health services are prescribed by, or are under the general direction of persons licensed to practice medicine or surgery in the State."

The types of rehabilitation facilities eligible for construction under the Hospital Survey and Construction Act as amended are:

1. Rehabilitation facilities (multiple disabilities) in a hospital.
2. Separate rehabilitation facilities (multiple disabilities) for inpatients and outpatients.
3. Separate rehabilitation facilities (multiple disabilities) for outpatients only.
4. Single disability rehabilitation facilities.

## EXPANDING SERVICES

Medical centers and medical schools are the keystones to expanding rehabilitation services and the further development of State plans for the coordination of health, medical and related services. In addition to facilities, some of the major areas of need are: scientific research to develop new knowledge and skill in rehabilitation methods; development of educational programs in rehabilitation; and expansion of programs in training of the various types of personnel. Therefore, under Public Health Service Regulations priority is given to projects located in medical centers, medical schools or universities with medical schools, and projects providing a multiple disability service.

As stated in the Public Health Service Regulations, an integrated program of rehabilitation is a blending of medical, psychological, social, and vocational evaluation and services. It is a teamwork program from beginning to end. Each team member should have common understanding of the philosophy, objectives, policies and relationships to other community resources and organizations. He should have a clear definition of his function and responsibilities in relation to the total program, the patient, and all other staff members. He should be fully aware of and maintain ethical standards and practices.

Not all chronically disabled persons need a comprehensive rehabilitation program. Obviously too, not all patients can be rehabilitated, either because of the extent of the dis-

ability or the inherent inadequacy of the individual. However, many can be and want to be helped.

Medical and related services must be prescribed by or under the general direction of persons licensed to practice medicine or surgery in the State. These may include nursing, psychiatric, dental, physical therapy, occupational therapy, speech and hearing therapy and prosthetic services. After medical evaluation, methods of treatment are prescribed to minimize the physical and psychological limitations of the disability and to determine the effects of activity and aging of the individual with particular disabilities.

A physical defect has a personal and often unconscious significance for the disabled person. The psychiatrist evaluates the emotional abilities, disabilities and potentialities of the disabled individual and assists in developing programs of activity. The success or failure of the total team's effort may be directly related to the psychiatrist's efforts and ability. The psychologist working closely with the psychiatrist provides essential information concerning the patient.

Patients' needs are often complicated by social factors and require the assistance of the medical social service group. This involves the study of the individual patient's interests, social situation and needs in relation to his illness or disability and assistance in adjusting to problems.

Although the primary purpose of a rehabilitation program in a hospital is the treatment of the medical aspects of disability, the ultimate goal of many handicapped patients is proper job placement. To reach this goal, a preliminary vocational exploratory program is integrated with the medical program. This enables the vocational counselor and other members of the team to develop an educational or vocational program in keeping with the patient's health status, general abilities, social attitudes, work approach and work tolerance. Vocational training as such is seldom, if ever, carried on within the hospital.

Before any intelligent planning can be started, a written program is necessary. This program must delineate the objectives of each department, the methods to be used in the achievement of those objectives, the estimated patient load, staff requirements and the physical facilities and equipment with which these objectives can best be carried out. It must be based on a survey of the needs and resources of the community and must consider the type and size of the area to be served, services to be provided, and services already available. To this task must be brought the knowledge of the physician, psychologist, administrator, nurse, therapist, vocational counselor, and social worker, working together with the architect. The planning committee for this department should have at least one member who has an overall concept of rehabilitation.

## MAJOR ELEMENTS

The major elements of rehabilitation facilities (multiple disability) in a hospital are as follows:

- **Administrative facilities**
- **Evaluation and treatment facilities**

### MEDICAL FACILITIES

Facilities for medical evaluation and treatment  
 Dental facilities  
 Physical therapy  
 Occupational therapy  
 Facilities for teaching activities of daily living  
 Speech and hearing facilities  
 Artificial appliance facilities

### PSYCHOLOGICAL FACILITIES

### SOCIAL SERVICE FACILITIES

### VOCATIONAL FACILITIES

- **Nursing unit for adults**
- **Nursing unit for children**

Wherever it is practicable, all of these elements should be located within the department for better coordination of the services and for efficiency of operation. Some of the elements may already be present in the hospital and would not neces-

sarily have to be duplicated. The survey made in conjunction with the program would bring this out. The services normally provided by the hospital should be available also to the patients of the rehabilitation facilities.

A ground floor location for the entire department has several advantages. It provides easy access to the treatment and evaluation areas by outpatients, and easy access by both inpatients and outpatients to the outdoor exercise area without recourse to elevators. If site conditions will not permit the entire department to be on one floor, the evaluation and treatment area should be located on the ground floor.

Wherever possible, the entrance to the department should be combined with the entrance to the outpatient department of the hospital to avoid

duplication of facilities and to simplify patient traffic.

A parking area should be located nearby and a driveway and sidewalk should be provided to the entrance of the department. An entrance without steps and protected by a canopy is desirable.

#### Orientation:

Inpatient accommodations should be oriented for sun, maximum ventilation, and quiet and for ease of access to outdoor areas. Service and work facilities should be placed on the less desirable side of the corridor and in the center of the unit.

The evaluation and treatment area should be easily accessible to inpatients of the rehabilitation department, other inpatients and to outpatients. Exercise room or rooms

should have direct access to the outdoor exercise area.

Interior traffic lines for the movement of patients and for the delivery of food supplies and laundry should be simple and direct.

The size of the department will be based on the findings of the survey of the needs of the community it is to serve. In determining the size of facilities for inpatient and outpatient services, it should be kept in mind that the outpatient load is usually much larger than the inpatient load. In addition to the community needs, patients from other communities may also be referred for specialized rehabilitation services. While some rehabilitation services could be provided readily in communities with small hospitals, the development of extensive rehabilitation services in such hospitals is not feasible.



# REHABILITATION—

## *a doctor's viewpoint*

WITHIN recent years, rehabilitation has reached a level of professional acceptance and it is no longer necessary to debate its values. The separate rehabilitation centers that have sprung up in the larger cities in the aftermath of World War II have proved beyond question the practicality of the basic underlying idea of rehabilitation.

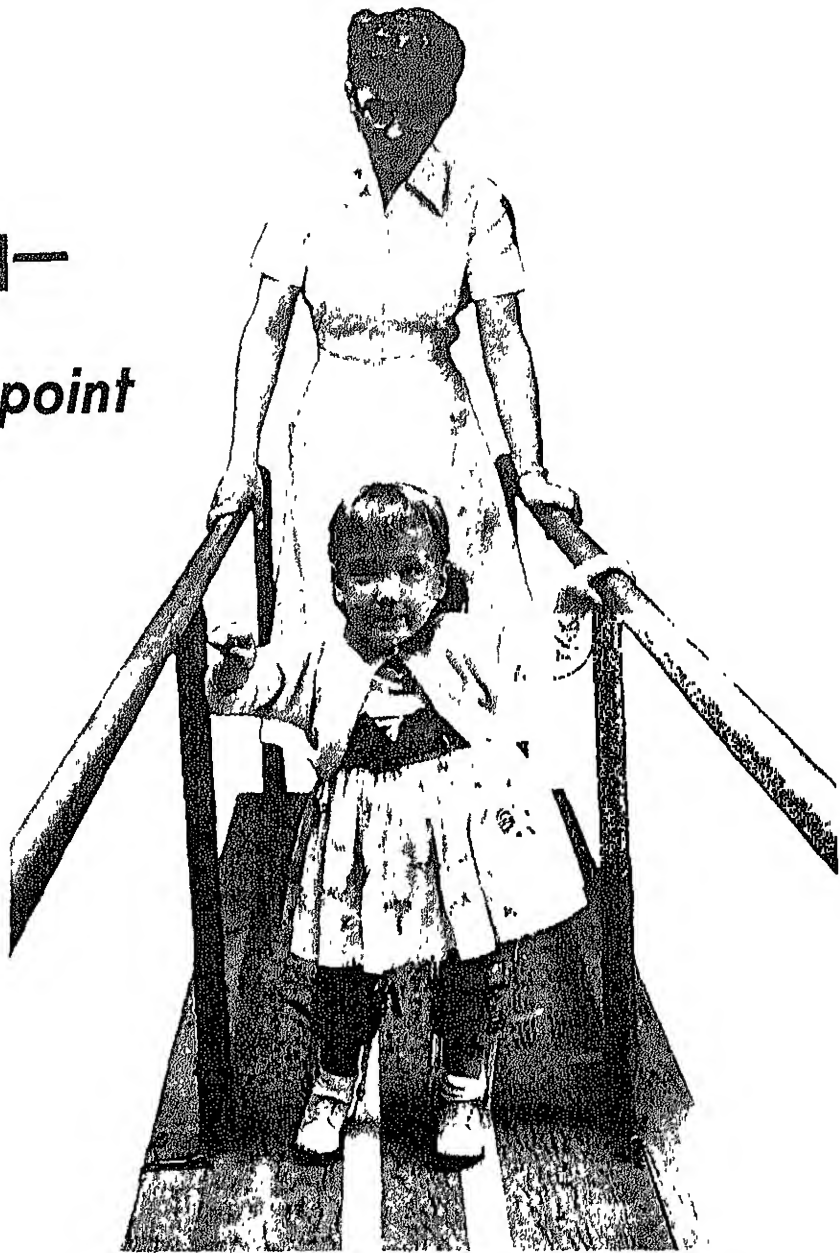
However, the fact remains that there are still large sections of the country where rehabilitation services are not available to the area residents. It is becoming increasingly evident that if the benefits of these services are to be extended to the smaller communities, the greatest hope for their creation and development rests with the community hospital. Such an approach takes advantage of existing facilities and also fits in with the current trend of integrating all community health activities with the hospital. Also, if the modern hospital is to fulfill its function in the community, it is difficult to see how the need for rehabilitation services can be overlooked in planning new hospitals or health centers and in expanding physical plants. This does not mean that every hospital should be a rehabilitation center or provide services; duplication is both costly and unwise. By keeping thinking flexible, it is possible to chart a course of

action that will strike a balance between need and resources in a community or area.

Hospital administrators and doctors are aware of the social and economic values of rehabilitation as is evidenced by the programs presently being developed in some of the smaller communities. However, in the areas in which steps have not been taken to provide such services, there is an increasing need for hospi-

tal administrators and medical staffs to get interested in the field and do the groundwork in developing the philosophy from which a program will evolve.

What is the philosophy of rehabilitation? It is a faith in the fundamental value and integrity of human life and a conviction that by positive action we can improve circumstances which threaten the opportunities of those who are disabled. It means





preventing permanent impairment whenever possible. It means putting at the disposal of the handicapped all the resources of modern medical, vocational, educational, and social services to make it possible for them to adjust to their handicap, to develop their abilities fully and to find a place in society where they can live and work on equal terms with others.

But employment and economic independence are not the only objectives of rehabilitation. For some handicapped persons it may often mean only a certain degree of functional ability for self care. The end result in either case is the same—maximum adjustment and usefulness.

To start a program a firm conviction that the end point of patient management involves more than the healing of a pathological process is required. This then points to considering the medical, social, psychological problems of the patient. The administrator or doctor, once he accepts this conviction, must sell it with missionary zeal to the medical staff, the board, the entire organization and the community. He also accepts the fact that these services have to be coordinated and to make them coordinated they have to be brought together under one roof. He realizes and stresses that a team approach is required to provide the necessary services; that coordination of team skills produces the end result, not the performance of any one individual.

If these concepts are kept in mind and propounded at every opportunity, a rehabilitation program is in the process of being formed. No building, no expansion of facilities or no outlay of funds is immediately required. The first step is building the philosophy from which the program will spring and getting this accepted by all those who will be involved in providing services, by the community and by other community agencies and groups.

At the head of the team is the program medical director who directly supervises the day to day medical care of the patient and who coordinates all of the services provided by the

paramedical members of the team—physical therapists, occupational therapists, nurses, and consultants. A trained physiatrist is ideal for this position, although if one is not available, a medical staff member with a real interest in rehabilitation could be prepared for it with additional education and with provision for consultation with a physiatrist as the program develops.

Every community hospital also has one of the basics to a rehabilitation program already functioning. This is the nursing service. With proper indoctrination and teaching, the nursing staff can be prepared for rehabilitation duties.

## REHABILITATION NURSING

At first glance, rehabilitation nursing seems like something brand new. This is not the case. It is nothing more than good, modern nursing care for the chronically ill and disabled. Many nurses are not familiar with this type of care because it has not been given much prominence in their educational programs. Its aim is to prevent the patient from becoming debilitated during the course of illness and to project thinking toward getting the patient up, arousing his interest to do things for himself and getting him discharged from the hospital as quickly as possible.

Again, the need for orienting the nurse to the rehabilitation philosophy and care of the total patient comes to the fore. Beyond this, she must become familiar with the techniques and objectives of rehabilitation nursing—meticulous care of the skin, bowel and bladder control, prevention of contractures, etc. Because treatment is carried over to the floors and is on a 24-hour basis, the nurse has the responsibility for seeing that therapeutic exercises prescribed for the patient on the ward are done and for training the patient to perform some of the activities of daily living. Needless to say, to fill these responsibilities effectively, she must know the total aims of the treatment program

and be familiar with the techniques of the other services that are integrated with nursing.

The nurse is brought back to the bedside in rehabilitation nursing. Her skills are concentrated on fewer patients and the care rendered is highly individualized. She has something in her hand other than a wash rag or a hypodermic needle. She gives the patient stimulation, encouraging him to achieve all the things of which he is capable. She constantly thinks of ways to get a positive response from him. In order to get a disabled person to tie a shoelace with one hand, or perform some other activity, she must know how to do the act herself. She always remembers that a bath is not given just to cleanse the patient; that bladder and bowel training is not given just to relieve physical needs. These and all other activities are directed to teaching the individual to provide for his own needs.

With such close contact with the patient, the nurse has a real interest in her work. She is challenged to become more proficient in the techniques of care and in finding ways to bring out the patient's best efforts. Because of this interest, she does a better job.

As was mentioned before, the concept of rehabilitation nursing is not new nor is it an extra specialty. It is just good nursing care with the rehabilitation philosophy added to it. As such, it can be incorporated into any school of nursing curriculum.

In setting up a nursing rehabilitation service in the community hospital, the administrator must move with care, making certain that the program is compatible with the nursing service available. Then, with the director of nursing, he should institute an instructional program to fill needs. The philosophy that the ultimate aim of

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essential to a rehabilitation program—the physical therapy department. The services now provided by this department can be utilized until expansion of both services and facilities is dictated by the interest of the medical staff and as it makes known its desires. Initially, the need for occupational therapy services might be deferred or perhaps some services might be obtainable in the community through some other agency or group.

### CAREFUL PLANNING NEEDED

The reader will note that no immediate expenditures are needed. Rather, caution in building, buying equipment, or assembling a staff is urged. The time to allot space, procure equipment or hire professional staff should be determined carefully, only after seeking consultation from all possible recognized sources and visiting institutions where successful programs are in operation.

Vocational, social, and psychological services needed to complete the spectrum of services in rehabilitation may be obtained from other groups in the community. What is available and how it may be obtained can be determined only by exploring resources in the individual community. Advice or help might be obtained from many sources: The State division of vocational rehabilitation; State or county boards of education; local, county or State health groups, such as cerebral palsy, polio, heart and crippled children's; industrial associations; hire the handicapped committees; business groups; business schools; community trade schools and the YMCA.

Through any or several of these groups, services may be available to determine the interests and aptitudes of the individual. Services to identify his problems and to formulate plans for their solution likewise may be obtainable through social agencies. Opportunities for him to engage in a variety of work experiences on a trial basis during which his performance

can be evaluated and his work tolerance determined might be afforded through the State division of vocational rehabilitation or through cooperation with industry in the community.

### THE INSTITUTE PROGRAM

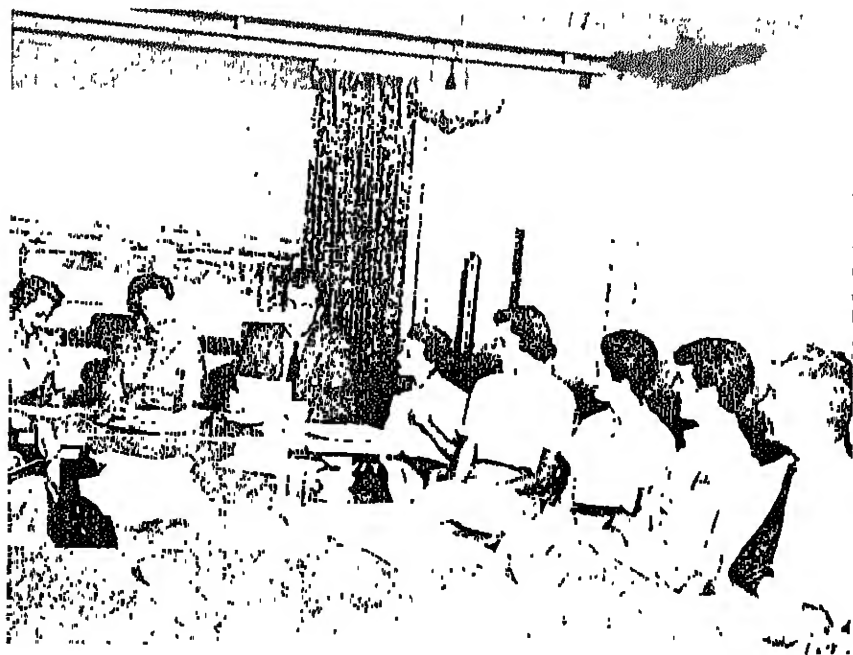
The thoughts expressed in this article have grown out of experience in operating the Institute of Physical Medicine and Rehabilitation. The Institute, sponsored by the Forest Park Foundation, is a nonprofit organization. There are two divisions; the Forest Park Home Division of St. Francis Hospital which has been in operation since May 1951 and the Methodist Hospital Division which has been operational since March 1954. The Institute occupies an entire floor in both hospitals and is administered by a nonsectarian, nonpolitical board which is responsible for operating policies, community relationships and maintenance of budgets for both operation and expansion of program. A medical advisory committee, composed of representative medical staff members from both hospitals, acts as an advisory body to

the board in establishing and maintaining policies regarding medical practices.

It is the intent of the Institute to have a complete physical medicine rehabilitation diagnostic and treatment service for both hospitals including physical therapy, occupational therapy, nursing rehabilitation, speech therapy, medical social service, vocational guidance, psychological testing and guidance, and job placement. At present, a well-rounded program is in operation which includes the entire scope of physical therapy, occupational therapy and nursing rehabilitation services.

### COMMUNITY PARTICIPATION

Vocational training needs of the patient are in part being taken care of by the State Division of Vocational Rehabilitation which has also assisted the Institute in every way possible to expand its services compatible with patient needs. Similar support and assistance is being received from the Division of Services for Crippled Children. Psychological testing serv-



ices are presently being obtained on a consulting basis. Job placement is being facilitated through the cooperation of Peoria industrial and business firms.

The Division of Special Education of the State Board of Education, as well as the county board of education, work closely with the Institute. Physical space has been made available for a cardiac work classification unit sponsored by the Greater Peoria Heart Association, local hospitals and the county medical society. A preschool program for cerebral palsied children has been established. Contact is maintained with many chapters of the National Foundation for Infantile Paralysis.

Schools of physical therapy are now using the Institute's services for clinical practice and training. Similar programs will be considered for occupational therapy schools and related groups. With regard to medical training fellowships, the various levels of training are being considered and to date one position has been filled.

An active program in the development and fabrication of assistive devices and the various types of equipment to improve the patient's independence in the activities of daily living is in progress. Instrumentation studies are being conducted in electromyography in collaboration with the electronics section of the Caterpillar Tractor Co. Other basic and clinical research programs are contemplated.

## EDUCATIONAL EFFORTS

A course in rehabilitation nursing, a part of the curriculum of the St. Francis Hospital School of Nursing, in which the entire professional staff of the Institute participates has been in operation for more than a year. Student nurses receive 16 hours of didactic teaching and 2 months clinical training.

Accepting what it believes to be its missionary role in creating a better understanding of rehabilitation

and in pointing out the community's stake in the program, the Institute accepts every opportunity to speak before organizations. The whole rehabilitation team goes to county medical society meetings upon invitation and demonstrates the principles involved in caring for the whole patient. A 1-year grant from the Office of Vocational Rehabilitation has permitted the Institute to operate a mobile rehabilitation clinic. Its purpose is mainly orientational and educational. Clinics are set up in outlying communities in conjunction with the local medical society and the Institute staff advises on the rehabilitation of the patients attending.

To stimulate interest in rehabilitation and to encourage early referral of patients, the Institute makes certain that any attending physician who refers a patient is kept informed of the care being rendered and progress being made. Each attending physician is supplied routinely with workups and progress notes. When his patient's case is being discussed at a team conference, the physician is invited to attend.

This brief recitation on the Institute's organization, the development of program and fulfillment of educational responsibilities indicates that our efforts and services are constantly expanding as resources and cooperation permit. The point is, creation of our program was based on need and stemmed from the community. Money to underwrite the cost was available through the Forest Park Foundation. The first unit at St. Francis Hospital was not planned specifically for physical medicine and rehabilitation, but the limitations of physical plant were overcome by careful planning. Lack of professional personnel to staff the various services has been a hindrance to more rapid development of program but not an unsurmountable barrier. A philosophy was first established; the program has evolved from this and will continue to expand. While our program represents only one approach to fulfill a community need, the pattern probably will be the same

in any community where rehabilitation services are inaugurated.

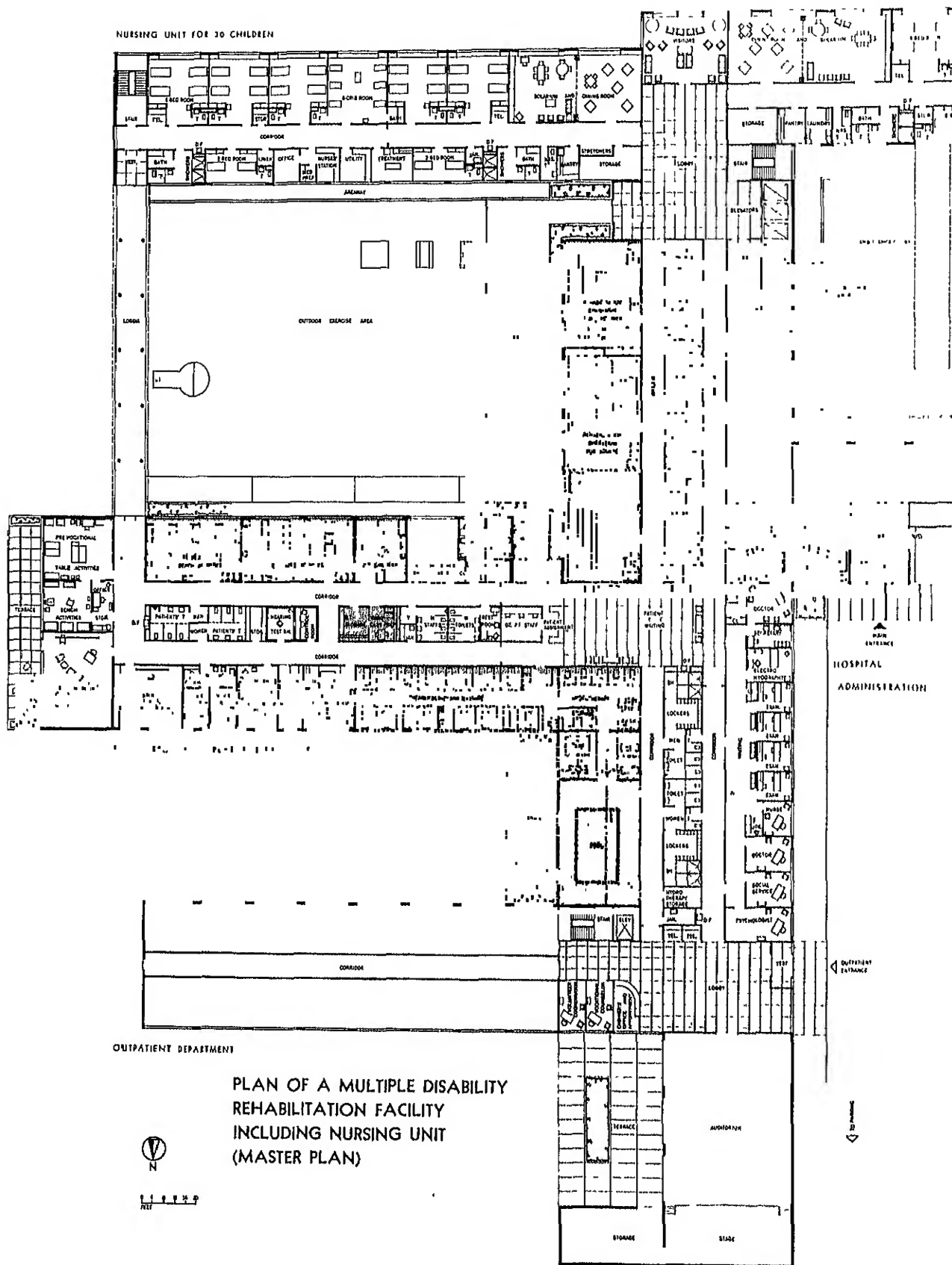
Recent Federal legislation has encouraged the development of rehabilitation programs and facilities. Grant-in-aid funds to the State rehabilitation agencies were increased and more flexibility was granted for their use by the 1954 amendment to the Vocational Rehabilitation Act. For the first time, Federal grants are available to private, nonprofit groups that can contribute to the expansion of the overall national rehabilitation effort. Traineeships and grants to institutions preparing people for professional work in rehabilitation are provided to increase the numbers of needed personnel. Grants can also be obtained for special research by institutions. Another provision makes it possible, at the discretion of the physician and State agency, to use Federal funds to pay hospitalization costs for the handicapped for more than the previously stipulated 90-day period.

Tying in with this was the earmarking of funds for payment of part of the cost of construction of rehabilitation facilities under the amendments to the Hospital Survey and Construction Act. Many States, in conducting the surveys required by the legislation, have for the first time come up with a real appraisal of what their rehabilitation needs are. While not many sponsors have undertaken projects in this area, many individuals and groups who have had a part in the survey process have received a real orientation to rehabilitation. This introduction it is hoped will stimulate interest and create a desire to fill the gaps that have been found to exist.

Hospital and medical people know that rehabilitation programs are necessary, and they are in a position to convince others that these needs exist, without overlooking the problems to be faced in meeting them. By assuming the initiative to translate opportunities into realities, they will be making an immeasurable contribution to community health and welfare.



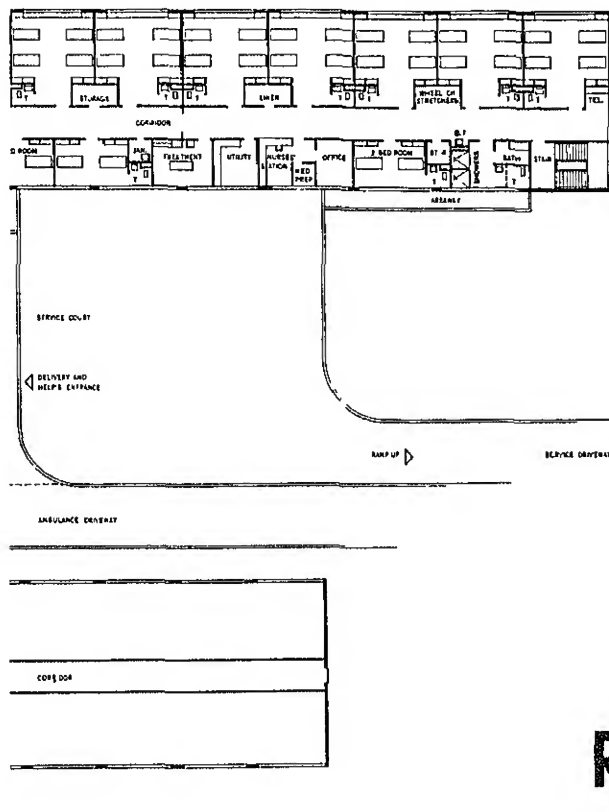
NURSING UNIT FOR 30 CHILDREN



PLAN OF A MULTIPLE DISABILITY  
REHABILITATION FACILITY  
INCLUDING NURSING UNIT  
(MASTER PLAN)



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FEET



# Plan of A MULTIPLE DISABILITY REHABILITATION FACILITY

[MASTER PLAN]

## GUIDELINES FOR ESTIMATING THE SIZE OF FACILITIES

At the present time it is not possible to determine precisely the size of the facility required for a particular community. However, there are certain guidelines which, intelligently applied, can provide a fairly close approximation of the extent of the services to be provided and space required for them.

Significant information can be obtained from physicians and hospitals in the area and from purchasers of rehabilitation services such as the State Vocational Rehabilitation Agency, Workmen's Compensation Board, insurance companies, crippled

children's programs, and other voluntary health groups. A study of existing facilities in communities of similar size and characteristics is also valuable.

The variation in the conditions to be treated and the kinds of treatments given at different times precludes any specific formula for space requirements. However, the following information which has been developed by the Joint Committee of the American Hospital Association, American Physical Therapy Association, and American Occupational Therapy Association, and others, based on actual experience of operating a specific program.

It has been estimated that between 5 percent and 20 percent of beds in the large general hospital should be set aside for rehabilitation patients. The occupancy rate in rehabilitation nursing units averages about 85 percent of capacity and the outpatient load in the evaluation and treatment area is 75 percent to 100 percent of the inpatient load. The length of time a patient spends in the evaluation and treatment area depends on his medical classification and degree of progress. About 90 percent of the patients benefit from a program of 5 hours or more a day for 5 days a week.

Space for physical therapy and occupational therapy accounts for the



greater part of the area of the evaluation and treatment facilities. The statistics given in table 1 should be used in conjunction with the previously mentioned manuals on these departments to estimate area needs.

**Table 1—Guidelines for estimating the size of facilities**

**PHYSICAL THERAPY:**

1. Percentages of patients treated in physical therapy unit daily—
  - (a) Rehabilitation inpatients (Treatments on inpatient floors 10%) 90%
  - (b) Other inpatients (Treatments on inpatient floors 5%) 5%
  - (c) Outpatients
 

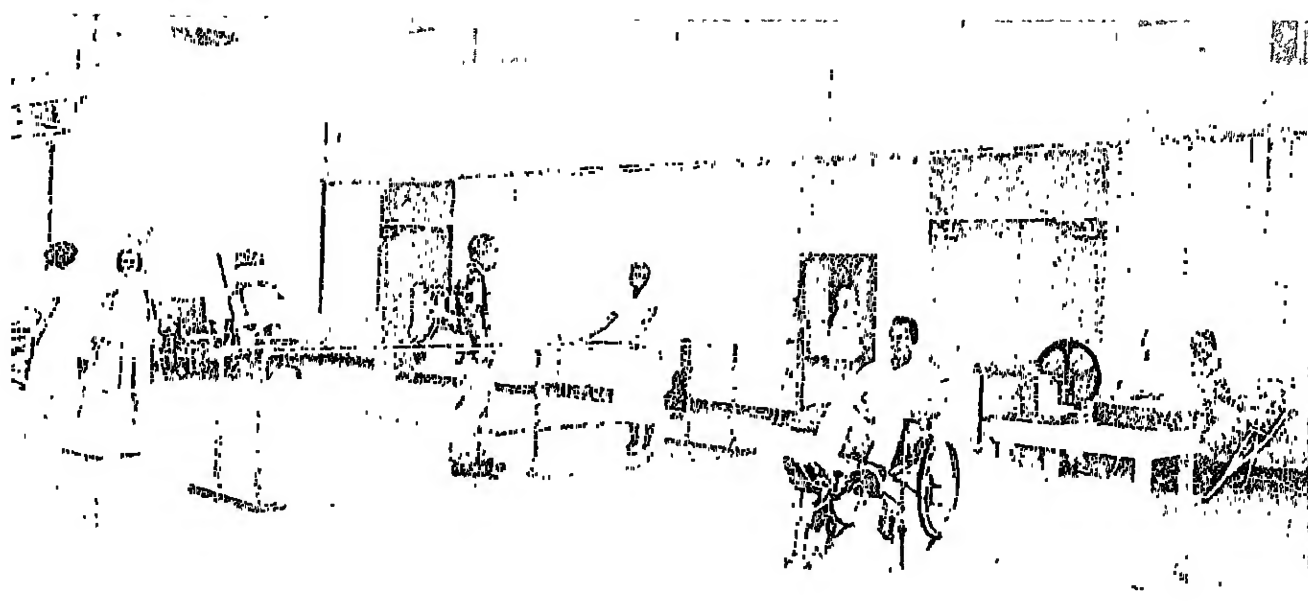
Rehabilitation	75%
General	20%
2. Average length of treatment daily:
  - (a)\* Rehabilitation inpatients 2 hours
  - (b)\* Other inpatients  $\frac{1}{2}$  to 1 hour
  - (c)\* Outpatients  $\frac{1}{2}$  to 1 hour
3. Ratio of staff to patients:
  - (a) Rehabilitation patients  
7–10 patients to 1 physical therapist and 1 aide
  - (b) General medical and surgical patients  
15–20 patients to 1 physical therapist and 1 aide

**OCCUPATIONAL THERAPY:**

1. Percentages of patients treated in occupational therapy unit daily—
  - (a) Rehabilitation inpatients 65%
  - (b) Other inpatients (Treatments in inpatient units 18%) 12%
  - (c) Outpatients
 

Rehabilitation	25%
General	5%
2. Average length of treatment 1 hour
3. Ratio of staff to patients
  - (a) Rehabilitation patients  
15 patients to 1 occupational therapist
  - (b) General medical and surgical patients  
20 patients to 1 occupational therapist

\*Includes undressing and dressing when required



## *Elements of A MULTIPLE DISABILITY* **REHABILITATION FACILITY**

THE MAJOR elements of a multiple disability rehabilitation facility are as follows: (1) administrative facilities; (2) evaluation and treatment facilities; (3) nursing units for adults and children; and (4) service facilities. These facilities, whether located in a new hospital or in an existing hospital, must be coordinated with other services to avoid duplication.

### **ADMINISTRATIVE FACILITIES**

The administrative facilities for medical rehabilitation in a hospital should include the following: lobby

and waiting room, appointment and cashier's space, office for the coordinator of volunteer services, public telephone facilities, and public toilets and personnel toilets.

The relation of the rehabilitation department to the central administrative services would be similar to that of other departments of the hospital. Special provision for administration, business, admitting, and medical records facilities is not required. The general administration of the rehabilitation services is under the direction of the administrator or assistant administrator of the hospital. The business department of the hospital manages such business activities

as financial transactions, accounting, records, and budgets.

Patients are usually admitted on referral by physicians, other hospitals, clinics, and social agencies. The initial procedure in admission should be through the hospital admitting department to facilitate coordination of the services of the hospital involved in the admission, examination, treatment, service, and discharge of the patients. The patient is referred to appropriate departments of the hospital for medical examination, treatment, and medical social history. This information is essential to the staff of the rehabilitation service in their evaluation of

the patient's disability potentiality for rehabilitation, and the types of treatment to be prescribed.

Medical records should be returned and controlled by the medical records department (or unit) of the hospital. A pneumatic tube system to convey records to and from the patient assignment and control desk in the evaluation and treatment unit, the nurses station in the rehabilitation inpatient units, and other departments of the hospital would be desirable.

#### LOBBY AND WAITING ROOM

The entrance to the evaluation and treatment area used by inpatients should be close to the rehabilitation nursing units and to the elevators used by other inpatients referred to this service. Also, the area should be easily accessible to outpatients for the convenience of disabled patients.

Provision of a common entrance lobby for the rehabilitation facilities and outpatient department avoids duplication of services used by both departments. The separation of waiting areas, however, is desirable to assure a measure of privacy for the rehabilitation patients.

The waiting room should be generous in size to permit free movement of patients in wheelchairs and on crutches. It should be well lighted and well ventilated, attractively decorated and furnished with chairs, sofas, and occasional tables of sturdy construction. Comfortable chairs with arms should be provided, but deep easy chairs are undesirable as many patients have difficulty getting out of them.

#### APPOINTMENT AND CASHIER'S SPACE

Where the rehabilitation facilities and the outpatient department are adjacent they may have a common appointment and cashier's space if it is convenient for rehabilitation patients. From this location they can be referred to the assignment and control unit within the rehabilitation department. If outpatients enter di-



rectly into the rehabilitation department, an appointment and cashier's area should be included with the patient assignment unit.

#### OFFICE FOR COORDINATOR OF VOLUNTEER SERVICES

The value of volunteers in rehabilitation work has long been recognized. They contribute to better patient care by assisting in some phases of nursing and treatment, and in recreational, educational, and prevocational activities. The coordinator needs a modest office in which to interview volunteers, maintain records, and schedule assignments for volunteers. It should be located near the outpatient entrance to the facilities.

Separate locker and toilet facilities for volunteers should be provided.

#### PUBLIC TELEPHONE AND TOILET FACILITIES

Public telephone and toilet facilities should be located adjacent to the patients' waiting area. (Details of these elements are discussed under general design details.)

The need for separate toilet facilities for the administrative staff and their location will depend on the requirements of the individual project. Usually a ratio of one toilet room for each six people is sufficient for staff workers.

#### EVALUATION AND TREATMENT FACILITIES

##### CONFERENCE AND LIBRARY ROOM

A conference room is required for meetings to develop and maintain teamwork of the various specialists and to promote educational activities, both of which are essential for a successful program. These meetings deal with policy, administration and the overall functioning of each service within the department, and with the evaluation of patients and planning for, or appraisal of, the rehabilitation program. Meetings for inservice training, seminars and other educational activities may also be held here. Attendance would vary from small groups of key personnel of the department to large groups, and may also include other medical and non-

medical consultants, students, and visitors.

The conference room should be conveniently accessible to the personnel of the department. A conference room in the hospital remote from the rehabilitation department cannot be effectively used by the rehabilitation staff.

Although a library is usually provided centrally in a hospital, separate library facilities for the staff and patients of this department are desirable. The requirements are not extensive and may be provided for in the conference room. In addition to the usual library and conference room equipment, X-ray film illuminators, projection screen, and chalkboard should be provided.

#### **MEDICAL FACILITIES**

Offices, examination rooms, and work space for medical personnel such as physicians and nurses are required in this area.

##### **Medical Director**

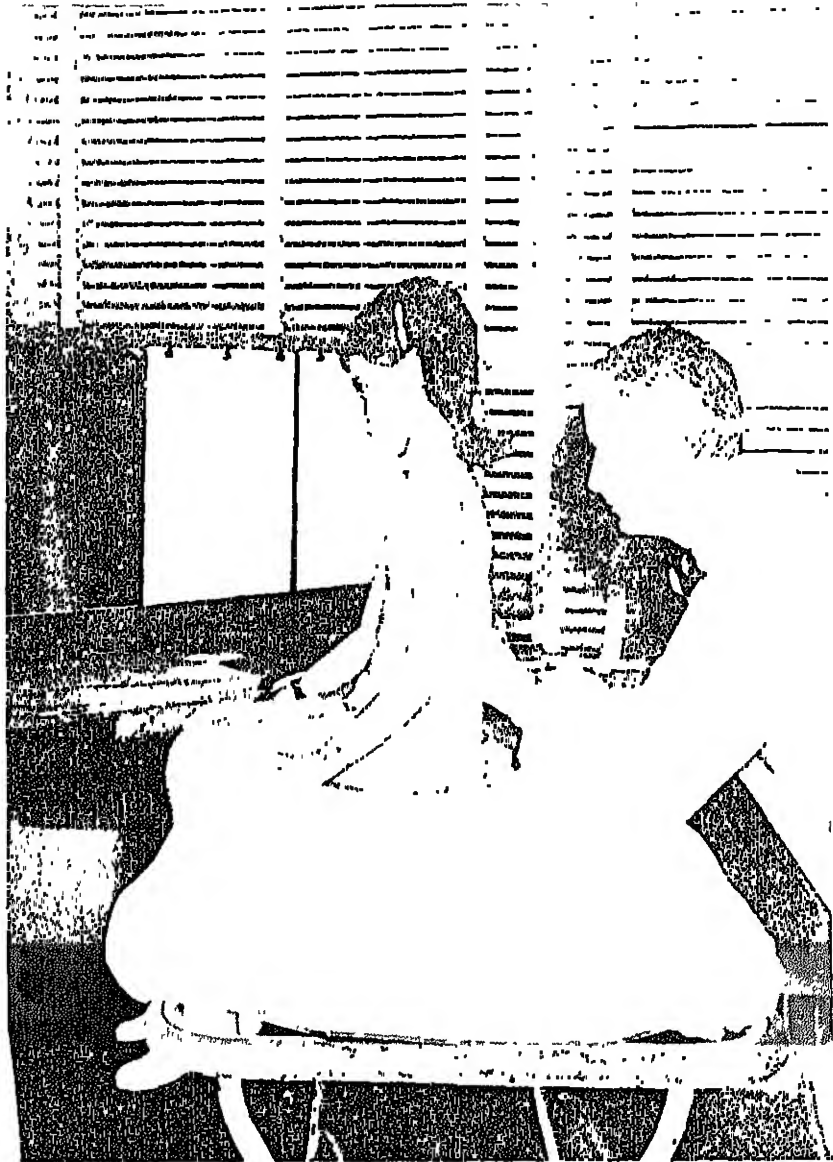
The medical director, usually a physiatrist, supervises the activities of the department, and in addition to his administrative, consultative, educational and research activities, he will examine patients and prescribe treatment. The director's office should be large enough to allow for meetings of about six persons. Room furnishings should include a desk, chairs, X-ray film illuminator, and a bookcase; a clothes closet and a toilet should be immediately accessible.

##### **Medical Director's Assistants**

At least one additional office is recommended for the medical personnel and for use by the assistant medical director. A typical consultation office would meet the requirements.

##### **Secretary's Office**

The secretary's office must be large enough to accommodate a desk and



the usual office equipment. It should be adjacent to the office of the medical director of the rehabilitation service.

##### **Examination Rooms**

The number of examination rooms required for the use of the medical personnel to examine patients will vary according to the patient load. However, a minimum of two rooms is recommended for each physician. They should be located adjacent to the physician's office and a waiting

area controlled by the director's secretary or nurse.

Each examination room should contain an examining table, footstool, lavatory, small desk, chair, X-ray film illuminator, storage space for supplies and equipment, and space for patients' clothing. Examining tables 30 inches by 78 inches and 33 inches high with a well-padded top with storage space below are recommended. Adequate space should be provided on both sides and at the end of the table to permit movement of the patient and the physician.

A separate room is desirable for electromyography\* if this service is included in the program. The room should be located near the doctor's office and in an area least subject to electrical disturbance. A shielded room is best for accurate results as the equipment used is delicate and is easily affected by electrical interference. The equipment usually includes, in addition to an electromyograph, a patient's bed, table with drawers, and a chair.

#### Nurses' Facilities

A nurses' work station should be provided in the evaluation and treatment area to accommodate nurses assigned to assist the physicians in examination and treatment of patients. A work counter or desk should be located near the waiting area and adjacent to the examining rooms. An office should also be provided for the coordinator of the nursing aspects of the rehabilitation service.

#### DENTAL FACILITIES

Dental services are an essential part of complete diagnosis and treatment of some types of rehabilitation patients. Although not usually provided within the department, facilities should be available in the hospital. The extent of the facilities needed must be determined on the basis of local needs and policies by representatives of the medical, dental, and

hospital fields. They may vary from a department of dentistry to a dental suite in the outpatient department.

#### PHYSICAL THERAPY

Physical therapy is a basic service in any rehabilitation program for multiple disability. The techniques of physical therapy include therapeutic exercise and massage and the utilization of the effective properties of light, heat, cold, water, and electricity as prescribed by a physician and administered by a physical therapist.

The Joint Committee of the American Hospital Association and the American Physical Therapy Association on Physical Therapy in Hospitals has recently published the manual, "Physical Therapy essentials of a Hospital Department." It supersedes a similar manual published in 1949 and is available from the American Hospital Association.

The manual includes information on personnel requirements, administration and finance, environment, space needs, and equipment and supplies. Also included are type plans and architectural details developed by the Public Health Service in co-

\*Electromyography deals with the determination of the location and extent of a nerve lesion by application of an electrical stimulus to a motor unit and recording through an oscilloscope, tape recorder or by sound, the action potential of the muscle supplied by that nerve. This procedure is used to assist in the prognosis and progress of the patient and for research purposes.

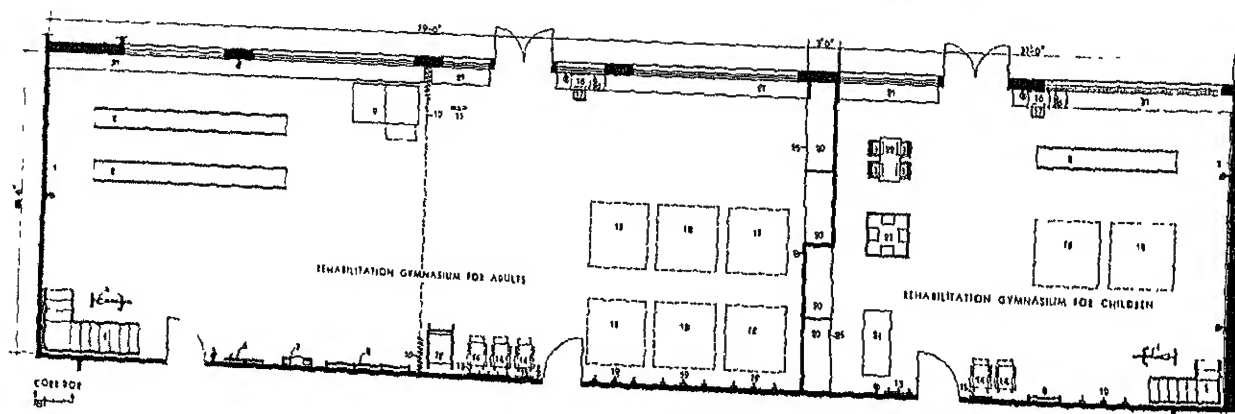
operation with the Committee. As this information can be adapted to the requirements for physical therapy facilities in a department of rehabilitation, the following discussion is limited to areas not discussed in the manual.

#### Facilities for Staff

Where several physical therapists are employed, one of them is placed in charge of physical therapy activi-

#### EQUIPMENT LIST FOR REHABILITATION GYMNASIUMS

1. Posture mirror
2. Parallel bars
3. Child-size chair
4. Stationary bicycle
5. Steps
6. Shoulder wheel
7. Pulley weights
8. Stall bars
9. Curbs and ramp
10. Folding partition
11. Cervical traction apparatus
12. Tilt table
13. Wall hooks
14. Wheelchair
15. Bulletin board
16. Built-in desk with knee space and drawers below
17. Straight chair
18. Gymnasium mat
19. Gymnasium mat hooks
20. Storage
21. Counter with storage space below
22. Table, adjustable height
23. Multiple place stand-in table
24. Treatment table with storage space below
25. Sliding doors
26. Telephone outlet



PLAN FOR REHABILITATION GYMNASIUMS



ties. This person is responsible to the physician in charge of the department and supervises the work of other physical therapists and attendants. Additional activities include coordination of physical therapy with other services and other administrative duties. A typical consultation office for the chief physical therapist is usually required.

A work station should be provided for the physical therapist and other staff members to coordinate schedules and reports of patient care. Additional work stations may be required in some physical therapy units. A patient assignment or control center is also essential for the coordination of appointments.

The accompanying plans indicate these elements in a central location adjacent to the waiting area.

#### Adult Rehabilitation Gymnasium

A gymnasium is essential in rehabilitation facilities for multiple disability. It is used for a variety of individual or group therapeutic exercises and may also be used for social recreational activities.

A general area is needed to allow movement for patients in wheelchairs, on crutches, walkers or canes, and for large equipment such as parallel bars, steps, curbs, ramps, bicycles, treatment tables, and other equipment used for the reeducation of muscles, walking, training and the management of various types of obstacles.

Gym mats are used extensively in this work; some exercises requiring their use are done in groups because group work stimulates the patient's interest, competition, and motivation. As many as 10 or more patients can be involved in the larger programs, and with each one using a recommended 6-foot square mat, space requirements increase accordingly.

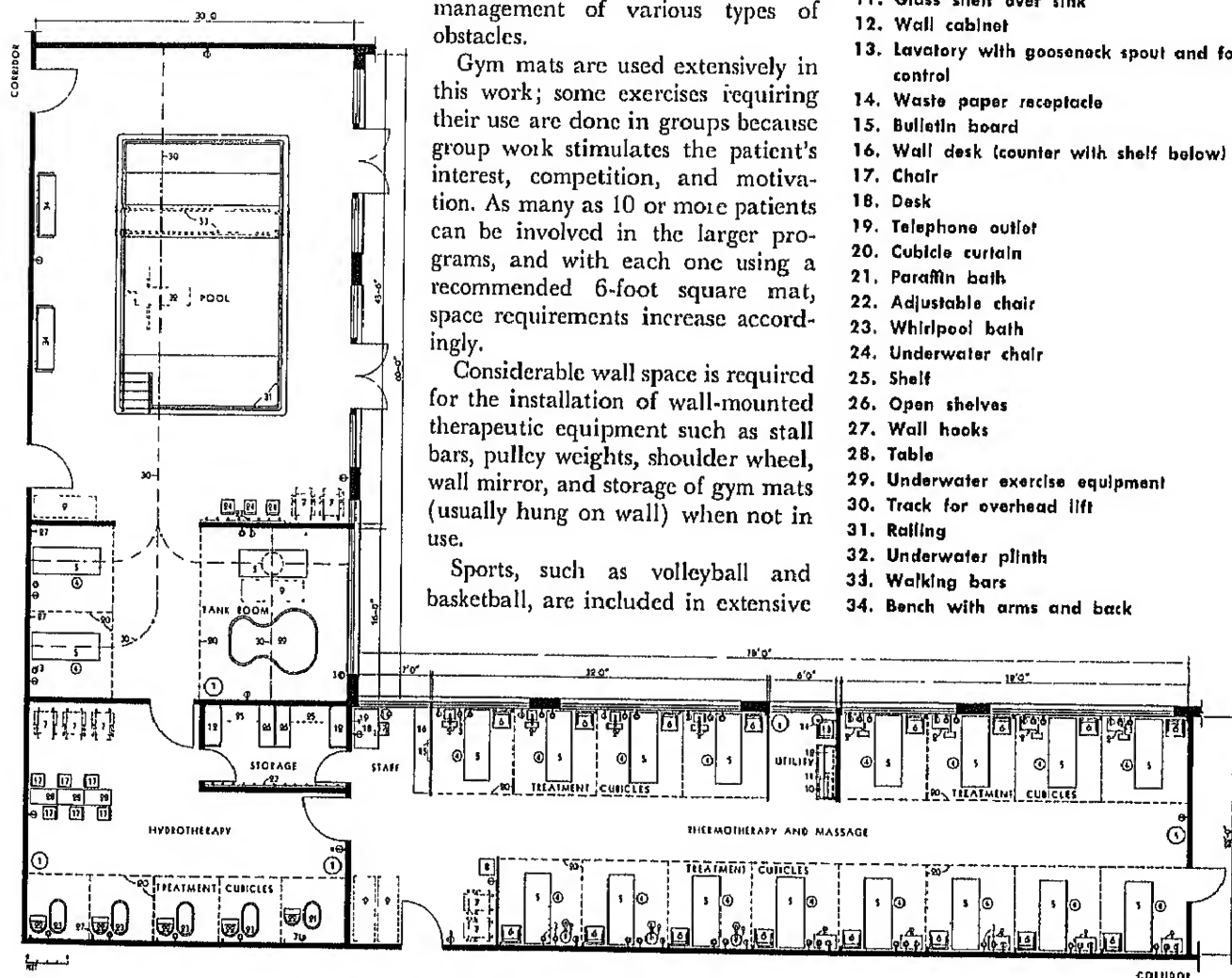
Considerable wall space is required for the installation of wall-mounted therapeutic equipment such as stall bars, pulley weights, shoulder wheel, wall mirror, and storage of gym mats (usually hung on wall) when not in use.

Sports, such as volleyball and basketball, are included in extensive

programs as advanced therapy for some patients to further strengthen them and to teach them sociability. Usually a typical basketball gymnasium is provided for all exercise

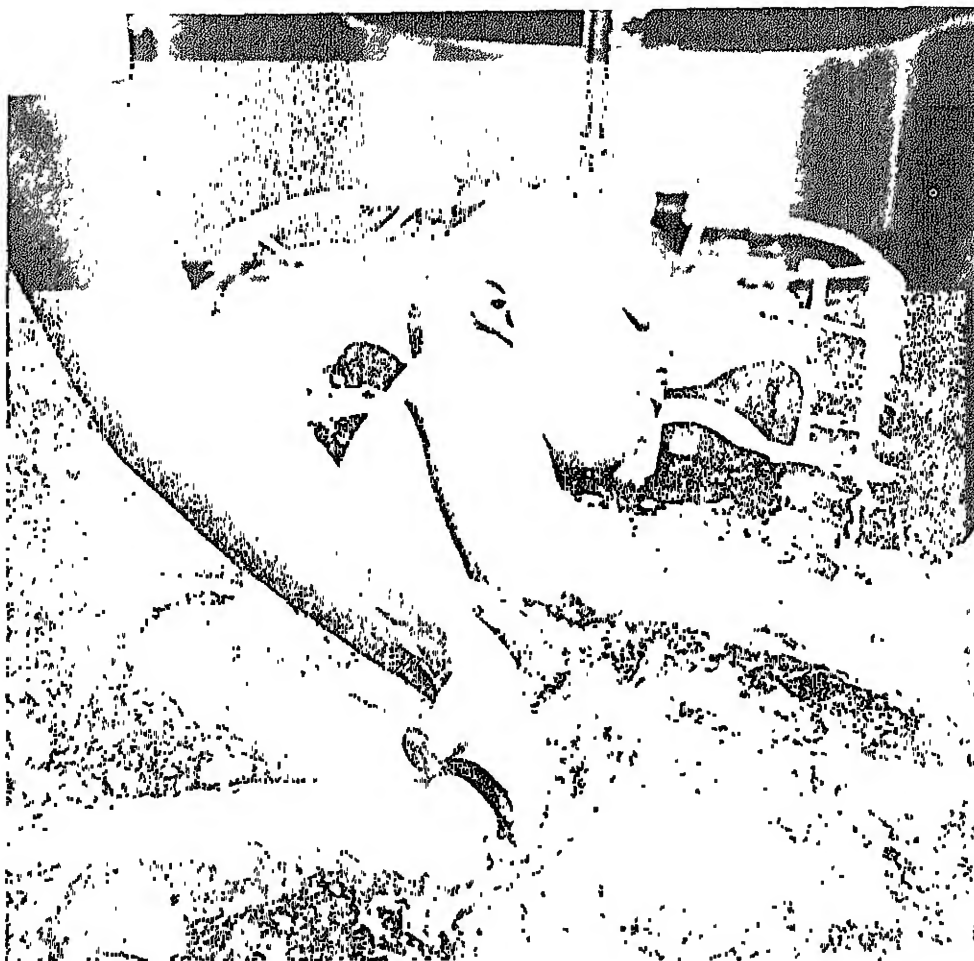
#### EQUIPMENT LIST FOR HYDROTHERAPY, THERMOTHERAPY, AND MASSAGE

1. Laundry hamper
2. Portable equipment
3. Single 3-pole outlet on separate branch circuit
4. Adjustable stool
5. Treatment table with storage space below
6. Chair, preferably with arms
7. Wheelchair
8. Water cooler
9. Wheelstretcher
10. Sink with drainboard
11. Glass shelf over sink
12. Wall cabinet
13. Lavatory with gooseneck spout and foot control
14. Waste paper receptacle
15. Bulletin board
16. Wall desk (counter with shelf below)
17. Chair
18. Desk
19. Telephone outlet
20. Cubicle curtain
21. Paraffin bath
22. Adjustable chair
23. Whirlpool bath
24. Underwater chair
25. Shelf
26. Open shelves
27. Wall hooks
28. Table
29. Underwater exercise equipment
30. Track for overhead lift
31. Railing
32. Underwater plinth
33. Walking bars
34. Bench with arms and back



PLAN FOR HYDROTHERAPY, THERMOTHERAPY, AND MASSAGE





activities. The floor area of the adult gymnasium in the accompanying plans is 2,100 square feet. Folding doors at the center permit divisions for various types of activities.

#### Children's Rehabilitation Gymnasium

Where small children are included in the program, a separate gymnasium for their use is desirable to accommodate the special therapeutic and play equipment required. Separate facilities avoid the distractions that occur when children and adults work together and also facilitates supervision.

The equipment used, such as parallel bars, steps, tables, chairs, mats, and tricycles, although generally similar to the equipment used by adults, is smaller.

#### Hydrotherapy Area

Hydrotherapy involves the use of water for therapeutic purposes and is an integral part of physical therapy. The hydrotherapy area should be concentrated in one section of the evaluation and treatment facilities for privacy and for easier control of noise and humidity.

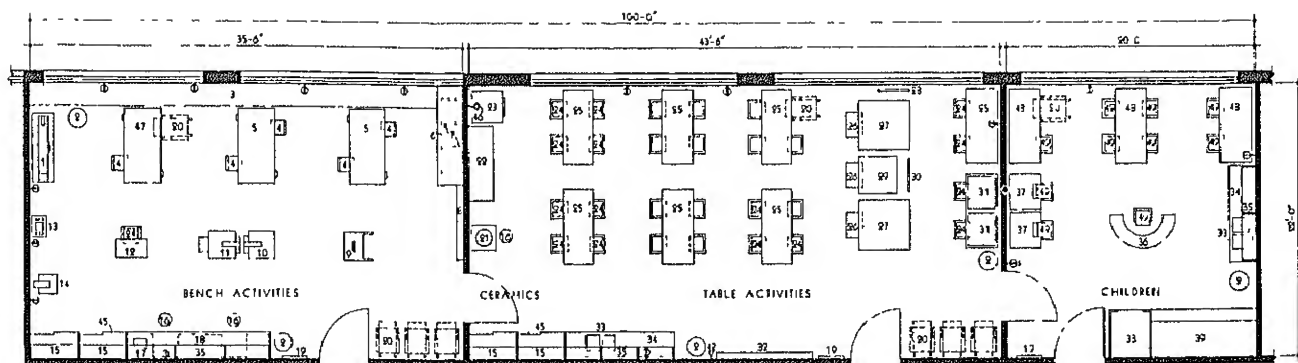
Major pieces of hydrotherapy equipment usually provided are whirlpool tanks, treatment tables, Hubbard tanks, and overhead lifts. Generous space is required for efficient operation as well as special treatment of finishes and details as described in the manual on physical therapy previously mentioned.

A therapeutic pool is desirable and is usually provided in extensive rehabilitation facilities such as those

indicated in the accompanying plans. Although not essential, a pool is a valuable medium for the treatment of some types of patients to reeducate impaired muscles, to correct or prevent deformities, and to restore muscle function. It provides space for a complete range of joint motion and early ambulation, and may also be used for recreation.

The size of therapeutic pools varies with the extent and type of program and funds available. The minimum size recommended by authorities is 12 by 16 feet, but it should preferably be larger. The depth of the water should vary from 2 feet 6 inches to 4 feet 6 inches; a depth of 5 feet would be desirable for some pools.

The slope of the pool floor should be the minimum required for drainage, since a nearly level floor is nec-



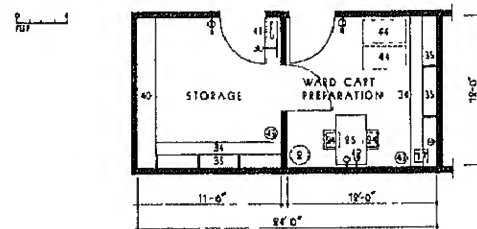
PLAN FOR OCCUPATIONAL THERAPY

NOTE: OFFICE FOR CHIEF OF OCCUPATIONAL THERAPY ADJACENT CORRIDOR

#### EQUIPMENT LIST FOR OCCUPATIONAL THERAPY

1. Woodworking lathe
2. Waste receptacle
3. Counter with open shelf below
4. Adjustable height swivel chair
5. Two-man workbench
6. Lumber rack
7. Wall bracket
8. Shadow board cabinet
9. Eight inch tilting arbor power saw
10. Electric jig saw
11. Bicycle jig saw
12. Treadle sander
13. Pedestal type grinder
14. Floor model drill press
15. Storage cabinet
16. Stool
17. Double element hot plate
18. Counter with drawers and cabinets below
19. Bulletin board
20. Wheelchair
21. Potter's wheel
22. Counter with cabinets and damp closet below
23. Kiln
24. Chair with arms

25. Flat-top table
26. Bench for floor loom
27. Large floor loom
28. Warping board
29. Small floor loom
30. Weave frame
31. Table loom
32. Gadget board
33. Double compartment sink
34. Counter with drawers and open shelf below
35. Wall cabinets
36. Circular table, adjustable height
37. Cut-out table, adjustable height
38. Playhouse
39. Sandbox
40. Shelving
41. Ironing board
42. Telephone outlet
43. Step stool
44. Ward cart
45. Sliding doors
46. Single 3-pole outlet on separate branch
47. Two-man workbench for patients in wheelchairs
48. Flat-top table, adjustable height
49. Child-size chair with arms



is intended primarily for exercises and for the convenience of the therapist while working in the pool with patients on plinths.

Locker and shower facilities are located across the subcorridor from the pool.

A therapeutic pool is usually the last item considered when providing facilities for physical therapy because of the space required, cost of construction, and cost of maintenance. In recognition of this problem, the American Physical Therapy Association has developed plans and specifications for a minimum size steel treatment pool, 12 feet by 16 feet, which may meet the needs of some rehabilitation programs.

#### Thermotherapy and Massage Area

Thermotherapy and massage are commonly prescribed for a variety of conditions. Considerable area is usually required to accommodate the treatment cubicles needed for patients' privacy. The cubicles should be at least 8 feet square and separated by curtains. Generous space should be provided in the unit for

essary for balance of patients and therapists and equipment used in the water. Variation in depth is provided by steps continuous across the pool. The area or lanes at the various levels for walking and other exercises should be at least 3 feet wide. Steps and handrails are required for access to the pool and should be located at the shallow end. Also desirable is a continuous handrail along the perimeter of the pool and slightly above

water level for use during the performance of various exercises.

Other equipment usually includes plinths, parallel bars, chairs, and an electric lift and overhead track to lower and raise patients in and out of the pool.

The pool indicated on the accompanying plans is 15 feet by 25 feet with five levels varying from 2 feet 6 inches to 5 feet in depth. The largest area, approximately 3 feet deep,

movement of disabled patients and portable equipment.

The thermotherapy and massage area should be located near the gymnasium to facilitate moving patients from one area to the other.

Major equipment usually includes heat lamps, diathermy units, hot pack apparatus, ultrasound and ultraviolet units. Detailed information regarding the thermotherapy and massage area is included in the manual on physical therapy previously referred to.

#### **Outdoor Exercise Area**

An outdoor exercise area is desirable where climatic conditions are favorable for this type of activity. In addition to therapeutic exercises and training in the management of various obstacles encountered in daily life, this area may also be used for social and recreational activities.

The equipment provided usually includes stairs, parallel bars, jungle bars, slide with stairs, sandbox, table and chairs. Space and equipment should be included for basketball. Also needed is a walking area surfaced with various materials, such as concrete, asphalt, brick, and flagstone, to help the patient become accustomed to walking on these surfaces. Street curbs also should be provided.

#### **Storage for Supply and Equipment**

Storage facilities, such as wall cabinets, shelves and closets, should be provided in each therapy room as indicated in the accompanying plans to accommodate various types of supplies and equipment used in the treatment of patients. A linen storage room and a general storage room located near the treatment areas are also required for storage of clean linens and equipment not currently in use or reserved for bedside treatment.

#### **OCCUPATIONAL THERAPY**

Occupational therapy is a medically prescribed treatment supervised

by a registered occupational therapist. The patient carries out a selected activity to assist in his physical, mental, social, and economic adjustment and rehabilitation.

Occupational therapy is divided generally into preventive or diversional therapy, functional therapy, and prevocational therapy. All these areas are important but in rehabilitation programs for multiple disability, emphasis is placed on functional therapy.

Functional therapy comprises prescribed activities planned to assist in the restoration of articular and muscular function, to improve the general condition, and to build physical endurance.

The American Occupational Therapy Association manual on planning the complete occupational therapy service contains their recommendations regarding facilities and equipment. This information was used as a guide to develop the accompanying plans for occupational therapy.

It is desirable to locate facilities for occupational therapy in the same general area as physical therapy. This relationship encourages the close coordination of activities that is essential in a rehabilitation program, since many patients are referred to both services.

Occupational therapy includes a variety of activities such as woodworking, metalwork, printing, typing, ceramics, leatherwork, and weaving. Quiet, clean activities, such as weaving, leatherwork and other types of table work should be separated from the noisy, dusty activities such as woodworking and metalwork. This arrangement also facilitates supervision of similar activities and the orderly arrangement of equipment and supplies. Separate, adjoining rooms for table work, bench work, printing, and ceramics may be justified in extensive programs; in limited programs some compromise is usually made. A generous area is required to accommodate such large equipment as workbenches, power lathe, drill press, jig saws, power saws, looms,

work tables, kilns and potter wheels. Considerable working and circulation area is required for disabled patients.

As in the case of the gymnasium, a separate occupational therapy room is desirable for children if they are included in the program. Use of a separate room facilitates supervision, limits distraction, and avoids accidents which could occur if small children have access to the equipment used by adults. The equipment provided for their activities must be scaled to meet their needs and usually includes special items such as cut-out tables, circular tables, play house, and sandbox.

#### **Office and Work Space**

An office for the chief occupational therapist and work stations similar to those previously mentioned for the physical therapy staff are required.

#### **Storage Facilities**

Ample storage facilities in the form of wall cabinets, shelves, bins, lumber racks, and wall brackets are needed within each room as indicated in the accompanying plans. A separate general storage room located near the therapy rooms should also be provided. It is also desirable to provide a ward-cart preparation room for the storage and preparation of occupational therapy materials used by inpatients confined to the nursing units.

#### **FACILITIES FOR TEACHING ACTIVITIES OF DAILY LIVING**

Activities of daily living impose many physical demands taken for granted by the average person. The inability of a disabled person to cope with these activities often constitutes a serious threat to his independent action.

Training in the activities of daily living is an important part of a rehabilitation program, as many physically handicapped persons must be retrained in such activities as getting in and out of bed, application and removal of prosthetic appliances,

dressing and feeding, use of toilet and bathing facilities, writing, and caring for other normal needs

When a patient is admitted to the rehabilitation service, he is usually tested for ability to perform various activities of daily living such as use of bed and toilet, eating, dressing, undressing, elevation activities, walking, climbing, and traveling. The ability to perform these activities is measurable and the test results indicate the extent of a patient's need for rehabilitation. A record of his performance is kept and an analysis is made to determine the procedures which must be taught in order to rehabilitate the patient. As each new procedure is learned, the progress is noted on the activity chart and training is continued until maximum results have been obtained.

Training in the activities of daily living is basic to a rehabilitation program and can be given in areas of the facility such as the nursing unit, physical therapy, and occupational therapy units, and the outdoor exercise area. In extensive programs, separate facilities for training in some of these activities may include a kitchen, living room, bedroom, and bathroom. Facilities for kitchen activities training are discussed in the following section on home management.

#### Home Management Program

Although activities of daily living would include home activities for many physically disabled, training for women in this area is usually referred to as a home management program because of the specialized type of training involved.

It is estimated that the homemakers of our Nation constitute one of the largest occupational groups among the disabled. Accidents or illnesses often affect their ability to bend, stoop, reach, lift, walk, or handle the usual tools of their work. In many cases these disabilities are permanent, resulting in a personal and economic burden on the family because of the inability of the homemaker to meet her responsibilities.



The home management program provides training that will develop self-reliance and encourage energy-saving methods in activities common to homemakers.

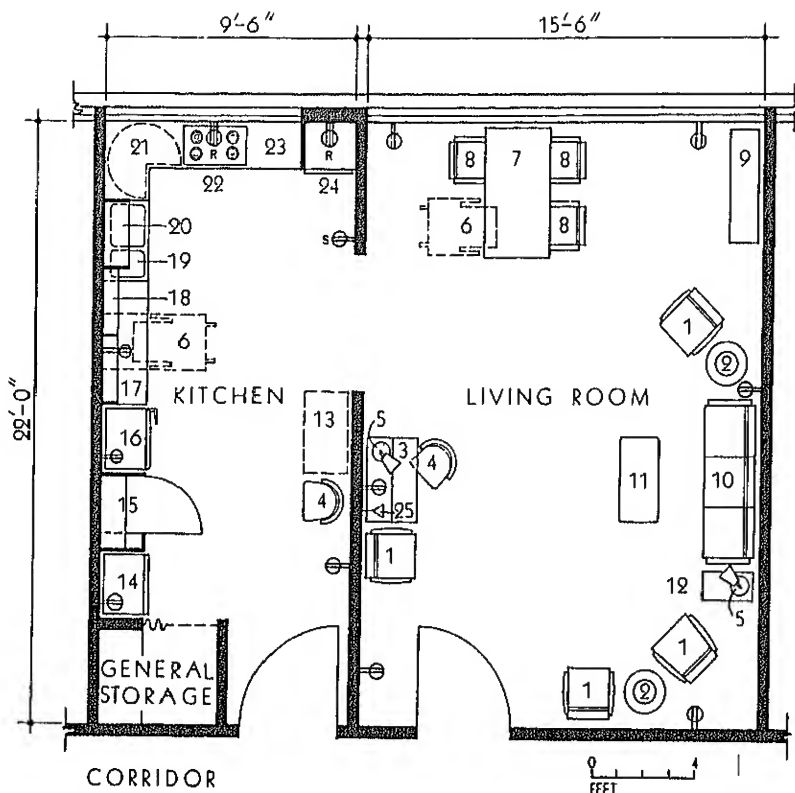
The areas of training may include body mechanics, work heights, kitchen arrangement, work plans, and simplification techniques for meal preparation, service, cleaning, and laundry processing. Training is provided in individual sessions, in small classes of persons with similar problems, and through meetings for demonstrations.

The homemaker thus becomes familiar with methods, housewares, equipment, and arrangements that will help make tasks easier and reduce the period of adjustment when she returns to her family environment. On her return home at the conclusion of the program, the patient usually has to purchase some special equipment and rearrange the facilities in her home. A follow-up service in the patient's home provides consultation on adaptation of methods and equipment to the patient's

home environment. This service may be an extension of a rehabilitation program in the hospital or a separate community consultation service. In the spring of 1958 a total of 145 agencies in 32 States and the District of Columbia reported providing homemaker services.

**Focus on Kitchen**—The program is primarily focused on kitchen activities, since they are a significant part of home management. However, a more comprehensive program would include training in other areas of the home environment.

The extent of facilities for a home management program will depend on the scope of the total rehabilitation program. Minimum facilities may be limited to basic kitchen equipment such as a work counter, sink, range, table, chairs, and storage facilities located in an occupational therapy room or a room used for training in other activities of daily living. Some facilities include a completely furnished kitchen which incorporates the general principles of good kitchen planning.



PLAN FOR ACTIVITIES OF DAILY LIVING

#### EQUIPMENT LIST FOR ACTIVITIES OF DAILY LIVING

1. Easy chair with arms
2. Floor lamp
3. Desk
4. Posture chair
5. Table lamp
6. Wheelchair
7. Dining table
8. Chair with arms
9. Bookcase
10. Settee
11. Low table
12. End table
13. Wheeltable
14. Automatic washer and dryer
15. Utility closet
16. Refrigerator
17. Counter with drawers and cupboards below
18. Shelving (6 inches deep)
19. Two-compartment sink with knee space below shallow compartment
20. Shelving (12 inches deep)
21. Counter with revolving shelves below
22. Range in counter
23. Counter with drawer and tray compartments below
24. Built-in oven
25. Telephone outlet

It is not practical to try to provide kitchen facilities that will meet the needs of all patients because of the differences in body proportions and types of physical disabilities. However, the unit should be designed to facilitate study of working conditions and equipment best suited to the individual. Since a sitting position is energy-saving and is considered preferable for all homemakers, a kitchen arrangement that would permit sitting for as many activities as possible appears to be the most practical. This would also provide flexibility in the use of the facility by patients confined to wheelchairs. The arrangement should provide sufficient area for movement of patients in wheelchairs

tant factor for relaxed activity. A 32-inch height for work counters has proven satisfactory for most activities performed by patients in wheelchairs and is also convenient for patients using an adjustable height posture chair. For a lower, more convenient position for mixing activities while using long-handled utensils, the wheelchair patient can use a tray on her lap attached to the arms of the chair. Other patients can adjust the height of the stool as necessary.

The sink is another important work center where many hours are spent preparing vegetables, washing dishes, and doing other tasks. Here again, a height of 32 inches is suggested. A knee space approximately 18 inches wide, with a minimum height of 24 inches, should be provided for the wheelchair patient at the sink. (Shallow two-compartment conventional depth with low depth bowl

which permit this arrangement, are available commercially.) The width of the sink should be limited to approximately 21 inches so that dishwashing supplies and miscellaneous tools hung on the wall or stored on shelves above the sink remain within easy reach. Storage facilities adjacent to the knee space should be conveniently arranged.

A central area for mixing and preparing other food is desirable. This center should also be designed for a sitting position.

**Appliances**—Appliances used in the kitchen can be standard equipment but they must be selected for certain convenient and energy-saving features. The refrigerator should have an easily accessible freezer unit, revolving shelves, storage shelves on the door for often-used items, and automatic defrosting.

The cooking element should be built into the work counter. Controls should be located in the front of the

unit for safety and convenience of operation. Work counters should be 32 inches high.

A built-in wall type oven eliminates bending and much lifting. It should be positioned so that when it is open, the inside of the door is 32 inches above the floor—the same level as the adjacent counter. This arrangement permits moving hot or heavy items from the oven to the counter with the least exertion.

A garbage disposal unit, automatic dishwasher, combination clothes washer and dryer will further help reduce lifting and other movement difficult for a disabled person. The garbage disposal unit must be located so as not to interfere with the knee space below a shallow bowl sink. The dishwasher should be a front opening type and the combination washer and dryer should have the controls located in the front. The combination type washer-dryer eliminates shifting wet clothes from one machine to another and reduces handling. Automatic timers should be included on all appliances, where practical, as a matter of convenience.

Movable equipment should include an adjustable posture chair, a wheeled table, and a dining table and chairs. The posture chair is intended for patients on crutches or canes, while working at the various work centers. As a means of transporting supplies, food, and equipment from one point to another within the living quarters, the wheeled table solves a difficult problem for many disabled persons. It is also used as a support in moving around. Sturdy construction is required—size approximately 13 inches wide by 24 inches long and 32 inches high.

The dining table and chairs are used for a variety of training activities.

**Extra Conveniences**—In addition, smaller appliances and numerous manufactured and improvised self-help devices will be used in the program. The recommended width and height of the work counter (21 inches wide, 32 inches high) are not standard and preclude the use of standard

base storage units. However, the conveniences built into the standard units should be incorporated in the special units needed in this area. Toe space, revolving shelves, removable tray shelves, vertical dividers for trays and pans, vegetable bins, and other arrangements that reduce stooping, reaching, and lifting should be provided.

Dish shelves are usually 12 inches deep but storage shelves for canned and packaged goods should be no more than 6 inches deep to reduce reaching for and moving of these supplies. The bottom shelf of the above-the-counter storage units should be 12 inches to 15 inches above the working surface; the top shelf should be no higher than 76 inches above the floor.

A utility cabinet for storage of cleaning supplies and equipment is essential. The cabinet should be designed to accommodate longhandled equipment and to contain shelving for storage of supplies.

All storage facilities should be coordinated with the work center activities. Also important are provisions for hanging a cane or crutches, spacing of electrical outlets in relation to work centers and not less than 32

inches from the floor, and special attention to the design of controls, handles, doors, and drawers for ease of operation.

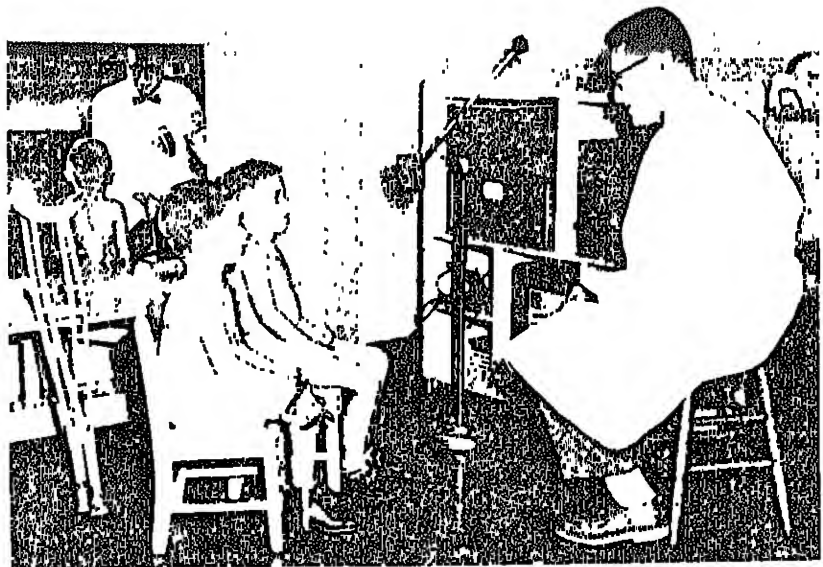
A living room and kitchen are indicated in the accompanying plans. A bedroom and toilet facilities are not required with this unit.

#### HEARING AND SPEECH FACILITIES

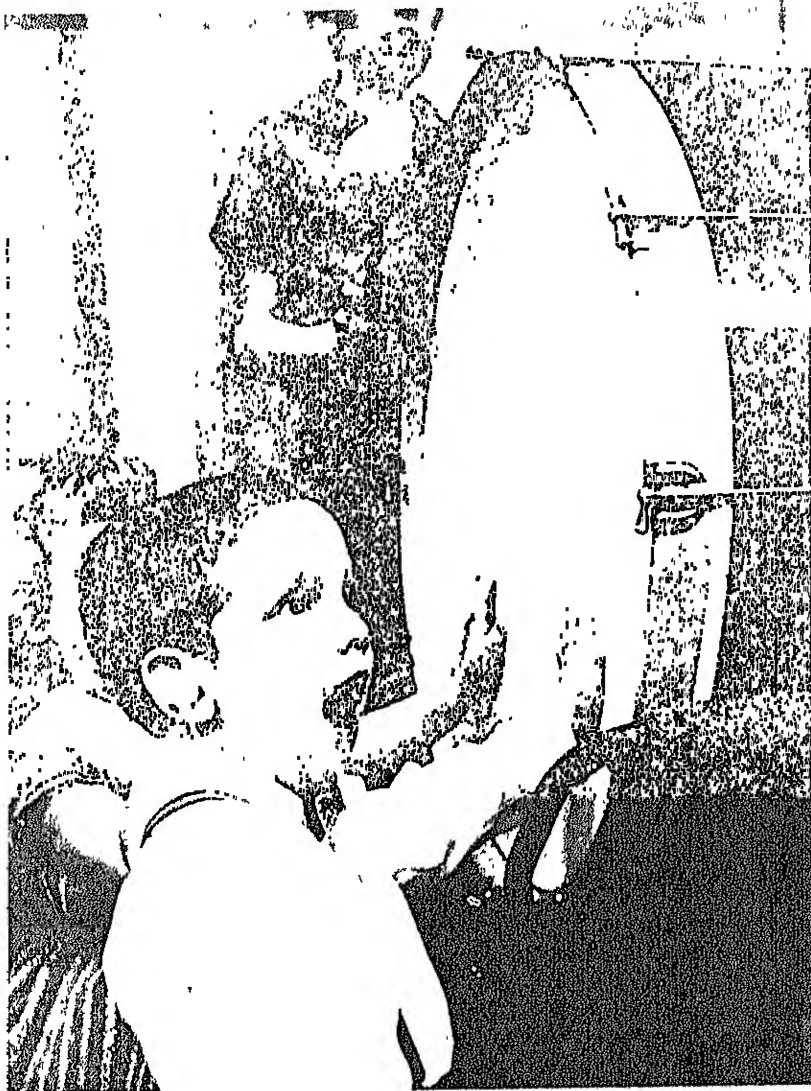
The ability to communicate through hearing and speech is one of the most important human assets in meeting the demands of daily living. Until recently, however, hearing and speech defects have not been given the consideration that other disabilities have received.

Impairment of hearing and speech of sufficient degree to interfere seriously with normal communication is as crippling as many other physical disabilities. A hearing or speech handicap, however, is not obvious as is a missing limb or distorted body which may account in part for the delay in sponsoring rehabilitation activities in this area.

A hearing or speech disorder often has a far more devastating effect on the growth and personality development of a child than other more ob-







vious defects. Likewise, the adult who develops a communication impairment often becomes self-conscious and finds it increasingly difficult to maintain his self-esteem.

Experience has shown that the hard of hearing person should receive the benefit of hearing and speech therapy as soon as possible. Psychologically, his readjustment to a world of sound can be made without permitting time for the development of negativism that often typifies the deafened person. Socially, he is able to maintain reasonable normal communication. Economically, he does not lose his stature as a self-sufficient individual.

#### Testing Tells Much

Accurate testing is essential for detection of early hearing loss, for arriving at a diagnosis, for determining the progress of the hearing loss, for checking results of therapy and for selection of hearing aids. Control of the testing environment is imperative for accurate audiometry and other hearing and speech testing and therapy.

Although there is variation in the estimates of the number of children and adults who would benefit by hearing and speech services, authorities agree that there is need for expansion of services, facilities,

teaching programs and research in this field.

During World War II the Army and Navy established four audiology centers in this country to rehabilitate members of the Armed Forces afflicted with hearing defects. The programs of these centers integrated the medical and nonmedical services in one facility and provided a type of service never before available to the hard of hearing.

The success of these programs, together with recent experience, accounts for much of the progress in developing techniques for detection, diagnosis and treatment that makes it possible to attack the problem of hearing and speech defects with reasonable assurance of success.

#### Science of Hearing

*Otology* and *laryngology* or, when considered as a single specialty, *otolaryngology*, are commonly used medical terms relating to the science of hearing and speech. *Audiology* is a relatively new term which may be defined as follows: Audiology is the science of hearing—an integrated concept of human hearing. Including more than the medical aspects of ear disease, it embraces every concept of art and science which can contribute to or form part of the propagation of sound, its transmission to the ear, its fate within the human organism, the psychological processes based upon the interpretations of perceived sound and the consequent reaction of the person to the mental concept engendered.

Patients requiring hearing and speech services present varying defects, such as deafness, stuttering, delayed speech, and voice disorders. These defects are the result of a wide variety of basic abnormalities, disorders, diseases, or injuries. Some of the more common basic conditions are cerebral palsy, otitis media, acoustic trauma, meningitis, presbycusis, cleft palate, ataxia, hemiplegia, otosclerosis, vocal cord anomalies and postoperative disorders following tonsillectomies, adenoidectomies, lar-

myngectomies and operations on the ear.

The extent of hearing and speech services in rehabilitation facilities for multiple disability will vary in accordance with the program. Some programs include services for all the conditions mentioned above; others emphasize services associated with certain types of disabilities, such as hemiplegia and cerebral palsy.

The treatment of hearing and speech disorders is complex and may require many clinical services. In addition to medical and surgical treatment, the patient may require linguistic, educational, psychological and psychiatric services. The otologist or otolaryngologist may refer patients to specialists in these allied fields for fitting of hearing aids, auditory training, speech and language training, lip reading, special education, psy-

chological adjustment and psychiatric treatment. One or more of these services may be indicated depending upon the nature of the specific case.

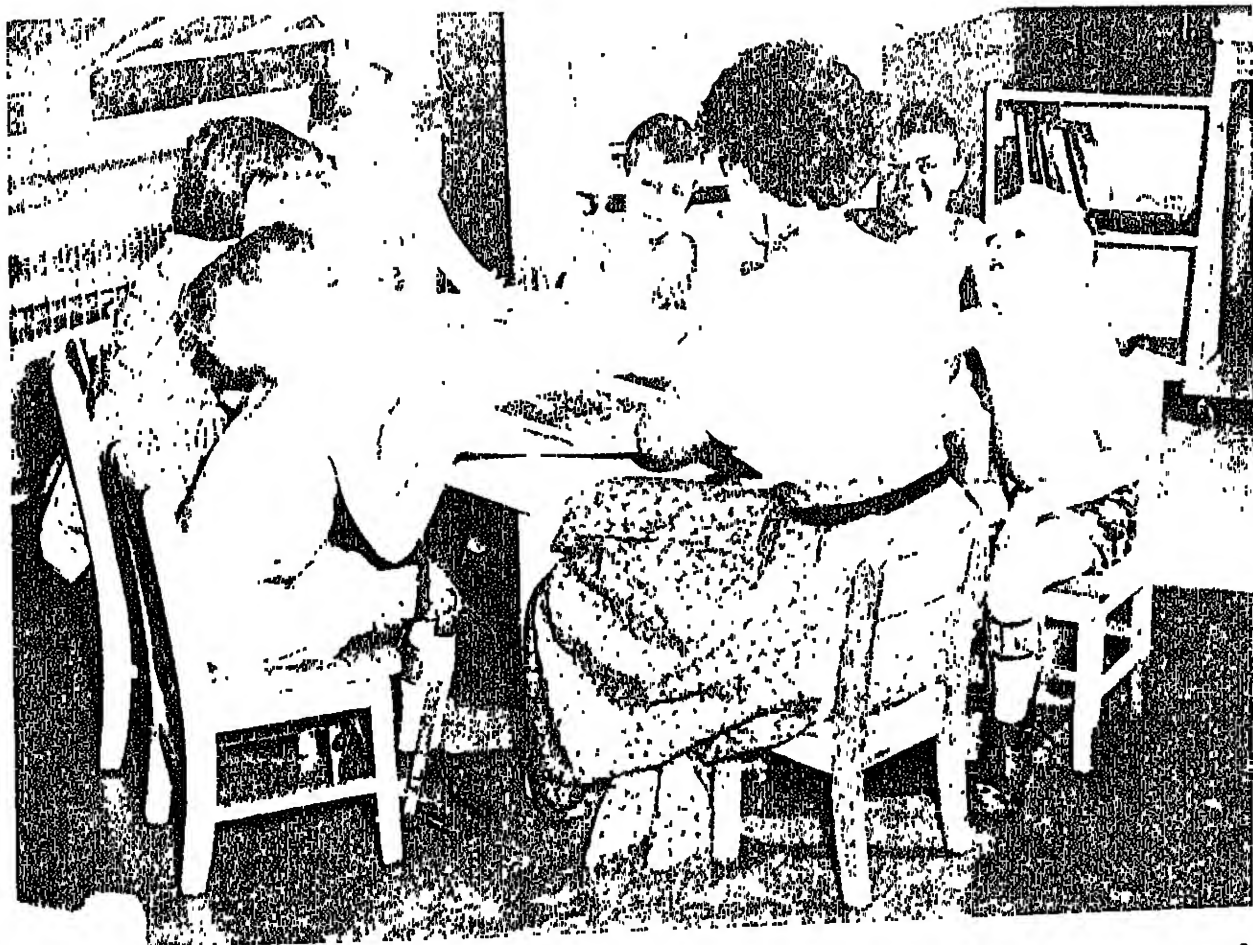
Hearing and speech services are an essential part of a balanced rehabilitation program for multiple disabilities and careful analysis should be made of the requirements for these services.

#### Coordinated Planning

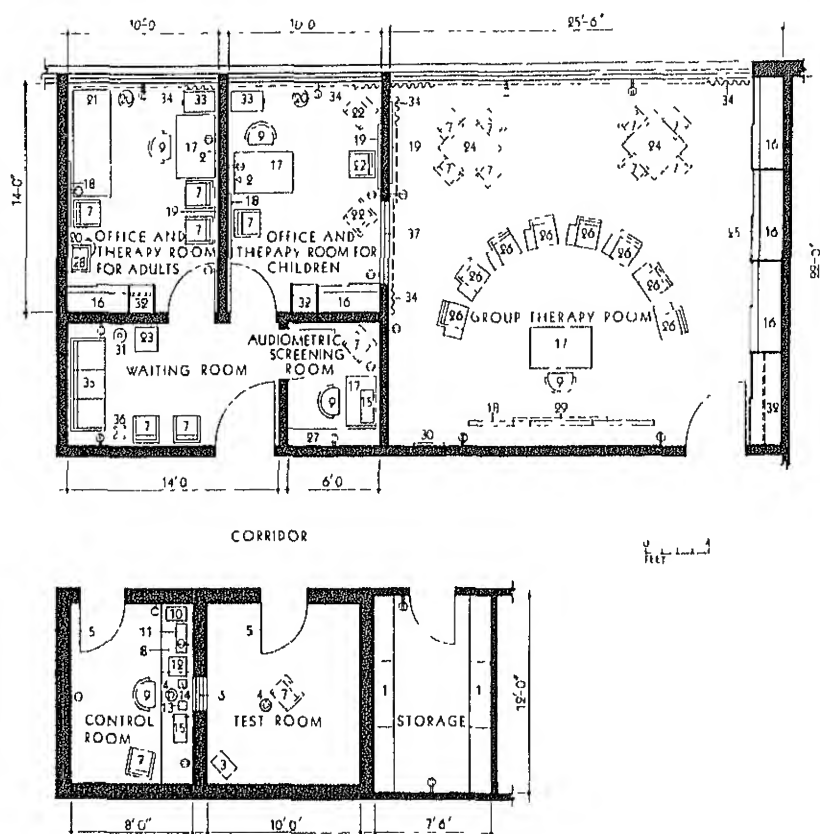
Programing for hearing and speech service is more effective if planning is done on a State and regional basis. Each State should develop a coordinated plan for these services based on a survey of needs in this category. Such a State plan, coordinated with related health programs, would form the general basis in determining the need, type and

extent of the program for hearing and speech services in rehabilitation facilities for multiple disabilities. In developing State plans, consideration should be given to the need for teaching and research centers, clinics, mobile units and programs for early detection and education. The teaching and research centers should function as a nucleus of activity with associated smaller centers in close cooperation. A limited number of these centers providing effective service are in operation today.

The rehabilitation center should have facilities for hearing and speech service. If adequate services are available elsewhere in the community, of course, they need not be duplicated in the center. In developing programs for rehabilitation facilities which will include facilities for hearing and speech services, it is important that







SUGGESTED LAYOUT FOR HEARING AND SPEECH FACILITIES

# EQUIPMENT LIST FOR HEARING AND SPEECH REHABILITATION FACILITIES

1. Shelving
2. Telephone outlet
3. Speaker cabinet
4. Microphone
5. Insulated door
6. Observation window
7. Chair with arms
8. Continuous counter with knee space and storage below
9. Swivel chair
10. Amplifier
11. Tape recorder
12. Phonograph equipment
13. Decibel meter
14. Talk-back receiver
15. Pure tone and speech audiometer
16. Storage cabinet
17. Desk with drawers
18. Chalkboard
19. Mirror
20. Waste paper receptacle
21. Couch
22. Child-size chair with arms
23. End table
24. Table
25. Sliding doors
26. Chair, student type
27. Shelf, 3 feet high with storage space below
28. Lavatory
29. Projection screen
30. Bulletin board
31. Floor lamp
32. Coat closet
33. File cabinet
34. Sliding curtain
35. Soffee
36. Costumer
37. Observation window (one-way glass)

detail requirements regarding the type and extent of these services be included.

The following material describes basic elements of facilities for hearing and speech in rehabilitation centers for multiple disability. These elements for audiology service are not minimum nor all inclusive. The elements required and the addition of others not described will depend on the program. For example, facilities for otological examinations, ear insert laboratory, teaching, design, construction and maintenance of equipment, and research are not included in this study, but they would be required for highly specialized services.

**Location in the Hospital**—Facilities for the audiology services should be located in the evaluation and treatment area of the rehabilitation department. This area is convenient for both inpatients and outpatients

and coordination with other services is facilitated.

Because of the nature of hearing and speech testing and therapy, these facilities should be removed as far as possible from sources of extraneous noise. One cause of error in audiometric and other audiology testing is the patients' failure to give full attention to the tests. Such distraction is frequently due to the presence of interfering noise. Street noise is a major source of such disturbance. Location away from the street, surrounded by other quiet rooms, and isolated from elevators, major corridors and other sources of airborne or vibration noise—above, below or near the unit—will result in an initial attenuation of sound reaching the test rooms amounting to several decibels and will reduce or eliminate the need for sound insulation in some rooms.

**Reception and Waiting** The need for separate reception and waiting facilities in audiology services will depend upon the scope of the program and the specific planning problem. The plans indicate a small waiting area adjacent to the therapy room which serves as an adjunct to the general waiting room for the rehabilitation department.

The general waiting area for this service and other services of the rehabilitation department should be well removed from the audiology facilities, as waiting patients, especially children, can create a disturbance problem.

**Table 2—Recommended lighting intensities for hearing and speech rehabilitation facilities**

Area	Intensity, in Footcandles
Waiting room	20
Audiometric screening room	30
Office and therapy rooms	30
Group therapy room	30
Control room	30
Test room	30
Storage	10

**Control Room and Test Room**—For precise results in hearing tests and for research and investigation in the field of hearing, a test room (from which transmittable noises are screened and absorptive acoustics are rigidly controlled) and an adjoining control room are usually required. This type of unit is desirable for the wide variety of tests that are essential in an audiology program. During hearing evaluation studies the patient is seated in the test room and the tester in the control room. By means of electro-acoustic equipment, the tester presents either live voice or recorded test material to the patient through a loud speaker or earphones at the desired sound level. The communication system between the two rooms should also include a talk-back system for some types of tests.

The control room must be large enough to accommodate comfortably two persons and the testing equipment. A size of approximately 8 feet wide and 10 feet long has proven satisfactory for this purpose. If used by the tester only, the room may be smaller, but the suggested size permits multipurpose use and is recommended.

A clear glass observation window is required between the control room and test room to permit the tester to observe the patient. It should be located in the approximate center of the partition and will require special installation for sound control. A continuous counter is usually provided along the window side of the control room to accommodate testing equipment. The electro-acoustic equipment for sound reproduction and

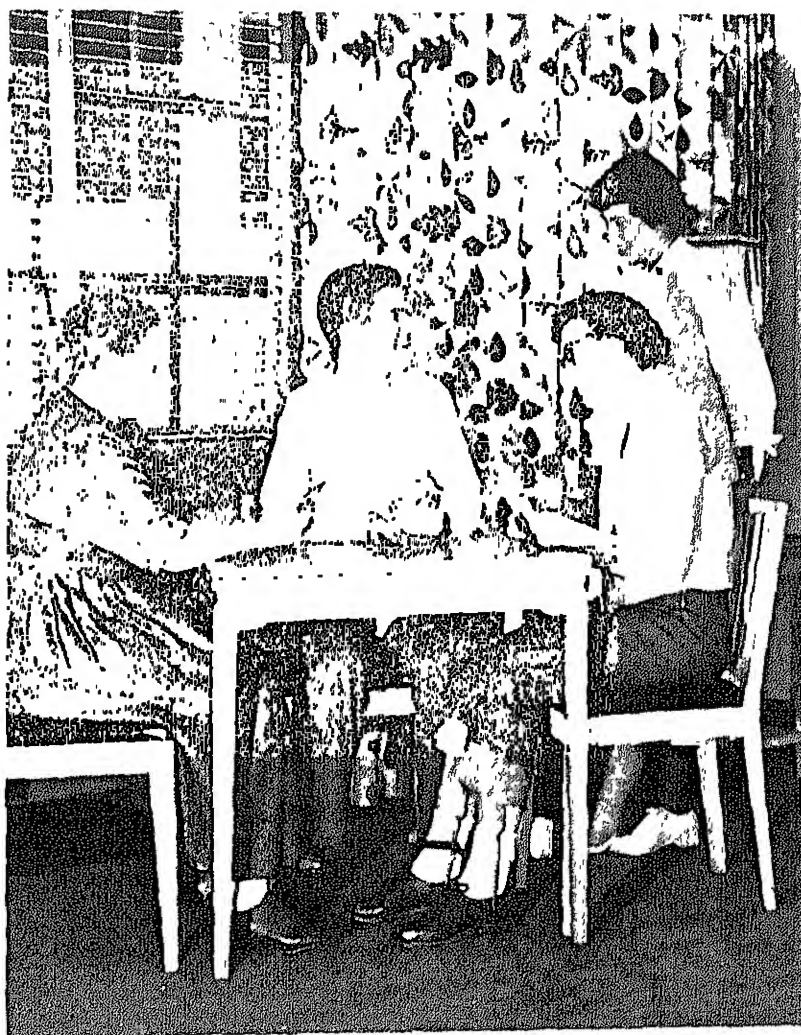
control must be of the highest quality.

All transmittable noises should be screened out of the test room and absorptive acoustics rigidly controlled. The size and shape of the room may vary, but approximately 10 feet by 10 feet has proven satisfactory for the types of testing performed. The loud speaker should always be placed so that it faces the patient. A door between the test room and control room may be a convenience, but it should be avoided because it often leads to acoustic isolation difficulties.

**Audiometric Screening Room**—The space requirements for audiometric screening will depend on the testing load. A separate room (or

rooms) is desirable if the patient load is large enough to justify such facilities and its use is usually restricted to routine screening of patients. If a separate room cannot be justified, the work can be done in the control room when not otherwise in use. Minimum size recommended for the screening room is approximately 6 feet by 6 feet.

**Office and Therapy Room for Adults**—Following medical evaluation, psychological appraisal, social interview and audiometric testing, a program of audiology services is developed for the patient. Depending on the needs of the patient, the program may include hearing aid selection, speech reading, auditory train-



ing, speech conservation and speech correction.

The office and therapy room provides office space for the therapist and hearing and speech therapy area for individuals or groups of two or three patients. It should be large enough to accommodate four individuals including the therapist, with space for movement of patients on wheelchairs or wheelstretchers. A room 10 feet by 14 feet is recommended. Good natural light, artificial illumination and ventilation are essential requirements. A minimum of four electric outlets should be provided in this room to accommodate instruments used in the therapeutic sessions.

If the number of children justifies it, a separate room for their use is desirable. Otherwise, with staggered sessions, one room can be used satisfactorily. Child-size chairs should be available.

A couch or treatment table is used in the treatment of some types of patients when relaxation and/or position is important, and during the process of making earmolds.

**Group Therapy Room**—Preliminary instruction is usually given to each individual receiving audiology services. Later, as skill is acquired by the patient, there are many advantages in group therapy for both patients and staff. Group therapy is essential for some types of patients, such as those with brain injuries, as such therapy provides conversation, socialization and class participation, important parts of the rehabilitation process. In addition to being an effective method of instruction, group therapy contributes to better utilization of personnel time.

This room may be used for various types of speech and hearing activities including re-education of residual hearing. Since headphones are used in this activity the room must be wired for group hearing aids. Experience in audiology programs indicates that the beneficial effects of group instruction are best realized if the class does not exceed seven or eight persons.



Here again, if a sufficient number of children are included in the program, a separate room for their use is desirable. With staggered sessions, however, one room can serve the purpose.

**Storage**—The provision of a separate storage room in the therapy area is desirable, but other nearby facilities may be used if space is not available.

**Acoustic Design**—The design of a facility for audiology services should reflect consideration of the following aspects of acoustic control:

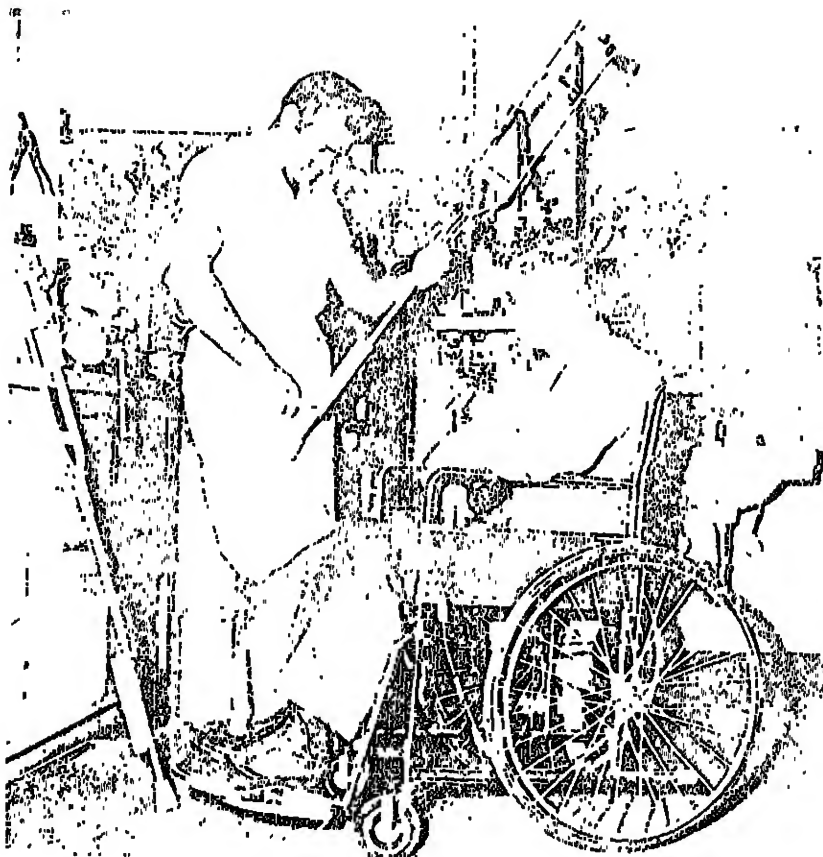
1. Reduction of noise within and outside the area.
2. Provision of favorable reverberation, reducing it for clarity while retaining enough to assure adequate loudness and reducing the distortion caused by uneven reflection of the components of a complex sound.
3. Distribution of sound.

Authorities agree that the control of sound in rooms used in testing and therapy in audiology programs is im-

portant. Opinion varies, however, regarding the desirable sound level of these rooms.

It is generally recommended that the control room and the test room be designed not to exceed 30 decibels on "A" scale. Therapy rooms should not exceed 40 decibels on "A" scale. A sound level of 30 to 40 decibels on "A" scale is considered satisfactory for audiometric screening rooms.

The acoustic design of facilities for audiology service should include acoustical treatment of ceilings and walls. The observation window between the control room and the test room should consist of at least three plates of glass with air space between, and must be carefully sealed. For exterior windows in therapy rooms, double glazing is usually required to reduce sound transmission. Doors to test rooms and control rooms should be of the self-sealing acoustic type and provided with a wedge or positive pressure type latch. Finish flooring of a heavy-duty resilient type has proven satisfactory in rooms used for



audiology services. Usually finish flooring in testing rooms and control rooms is mounted on absorptive material or a type of construction which reduces vibration.

**Air Conditioning System**—Where air conditioning or an extensive ventilation system is contemplated, the control of sound generated by the system will require careful study. Noise criteria are determined for specific areas and the designer can meet these requirements through a judicious location of equipment and proper use of insulating devices and materials.

The principal sources of noise from the system are: compressors, fans, motors and air velocities through the duct system and the outlet grilles. Such noises are transmitted throughout the structure by walls, floors, pipes, duct walls and by the air which travels through the ducts. Permissible noise levels can be at-

tained by: (1) isolation of heavy equipment from the building structure, (2) use of flexible connections between equipment and piping and duct systems, (3) insulation of the exterior and, in some areas, the interior of duct systems, (4) where air velocities are above normal, by the use of sound attenuation devices at outlet grilles of the ventilation system.

The basic importance of correct acoustical treatment of this area justifies the services of an acoustical engineer.

**Electrical System**—All electrical work should conform with the national electrical code. Convenience outlets should be provided in all rooms where plug-in service is required. Unless otherwise required, duplex receptacles should be provided approximately as shown in the plans. They should be located 12 inches above the floor, except near workbenches or tables where they

should be located above this equipment

Conduit with terminal boxes should be provided for wiring of recording, hearing aid equipment, and intercommunicating equipment where such apparatus is required.

General illumination designed to minimize glare and shadows should be provided in all areas. Either fluorescent or incandescent lamps may be used as light sources. Lighting intensities in footcandles in the various rooms should be approximately those shown in the plans. Ceiling-mounted lighting fixtures should be controlled by silent-type wall switches located at the door.

#### ARTIFICIAL APPLIANCE FACILITIES

Every year approximately 75,000 amputations are performed in the United States. Amputees require prosthetic appliances and instruction in their use to help them perform the activities essential for daily living.

And 75,000 patients are only a small part of the problem. In addition, many other patients medically classified as orthopedic, traumatic, arthritic, vascular and neurologic must be fitted with a countless number of devices to adapt normally used objects for use by the physically handicapped.

This part deals with the aspects of selection, fitting, adjustments and repairs of prosthetic and orthotic appliances which affect the design of facilities for this service. First, however, there are a few terms to get straight.

*Prosthesis* is defined as the replacement of a missing part by a medically prescribed artificial substitute. *Orthesis* is the application of a medically prescribed device to or around a weakened body segment to give support and increase or control function. In other words, prosthesis is a replacement and orthesis is an addition. Individuals constructing such devices are *prosthetists* and *orthotists*—a person may be certified as both.

The basic prosthetic clinic team is

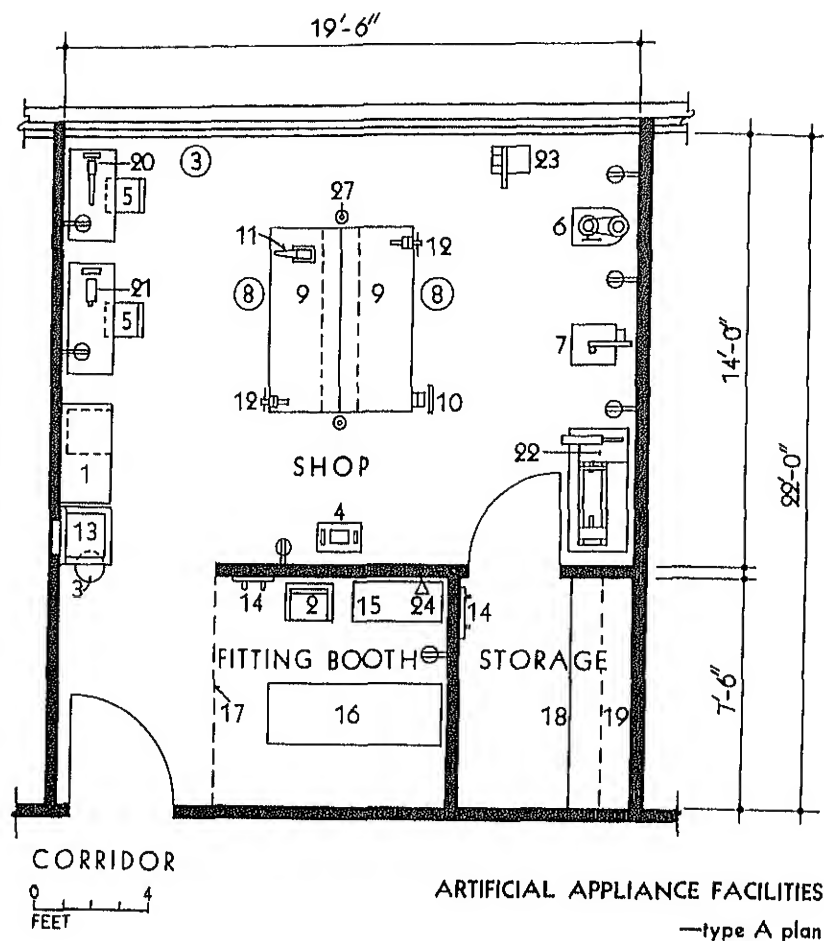
composed of a physician, a prosthetist, a physical therapist and an occupational therapist. A psychologist and social worker also frequently contribute to the rehabilitation plan for the patient. When the amputee is ready for fitting a prescription for a custom-made appliance is prepared by the physician based on the co-operative effort of the team.

Then the prosthetist usually prepares plaster casts of the area affected and takes the necessary measurement for the fabrication of the prosthesis. When the prosthesis is completed, the device is fitted and the amputee is instructed in its use by the clinic team. Quite often, use of prosthesis or changes of the stump during training make modifications necessary. After completion of training the amputee is again brought before the team for final evaluation.

The basic orthotic team is composed of a physician, an orthotist, a physical therapist and, in some cases, an occupational therapist. The rehabilitation procedure is generally similar to that of the prosthetic team.

The extent of the facilities for prosthetic and orthotic services will vary depending on the proposed program and sometimes on the availability of commercial prosthetic and orthotic services. Many rehabilitation facilities do not have a sufficient workload to justify the employment of a full-time prosthetist and orthotist. Usually in these cases an arrangement is made with a certified commercial firm to have a representative visit the facility as needed. In most instances this arrangement has proved satisfactory in regard to service and workmanship as well as financially.

Existing facilities for the part-time services of the prosthetist and orthotist vary. Sometimes a small shop is provided for this service. Most of the time, however, an office, a treatment booth, the gymnasium or some other area is used for consultation, taking measurements and fitting. Minor adjustments and repairs are done on the appliances in the occupational therapy unit. Under another arrangement the patient is referred



to the commercial shop where all procedures from making casts to final fitting take place.

#### Hospital Shop Recommended

A separate shop is recommended within the facility for the comprehensive rehabilitation program which serves a large segment of the population of a State. The shop would promote closer liaison between physician, prosthetist, orthotist and physical and occupational therapists, thus contributing to the effectiveness of the service.

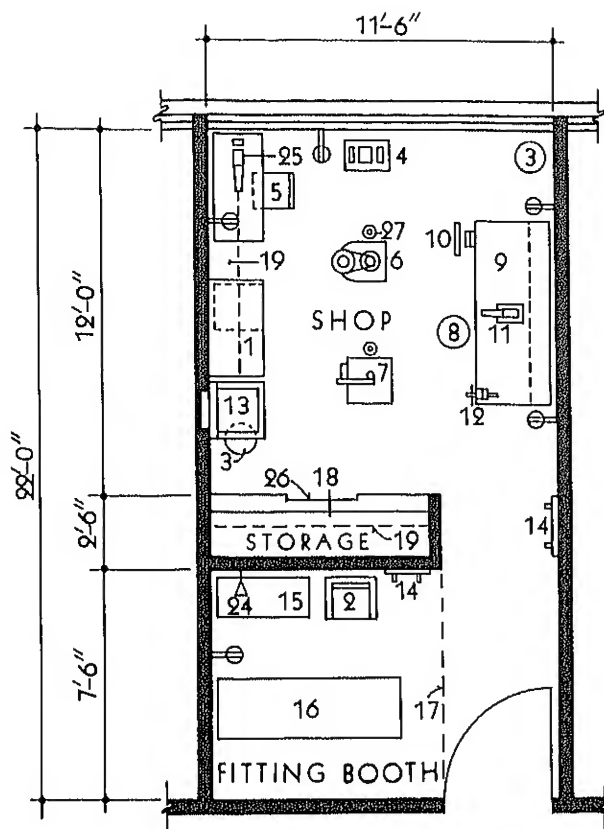
Facilities for the prosthetist and orthotist should provide space for consultation, taking measurements, preparation of molds, fittings, adjustments and minor repairs only. This type of facility is not intended for the manufacture of major appliances.

Consideration, however, should be given to the need for including facilities for the fabrication of some of the orthotic devices to meet the needs of individuals being trained in self-care. These devices include splints, crutches, feeders, reachers, page turners, typing sticks, and wheelchair adjustments and repairs.

**Location**—The room should be easily accessible to patients and staff and located near the gymnasium to permit the use of the gymnasium for trying out prostheses and braces.

**Office**—A separate office is not generally necessary. A small desk with drawers and a chair with arms should be provided in the fitting booth, however, for the use of the prosthetist or orthotist.

**Shop**—The shop shown in plan "A" includes equipment for the fabrication of orthotic devices and other



ARTIFICIAL APPLIANCE FACILITIES  
—type B plan

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features necessary for this service. A 9-inch screw cutting metal lathe is required for the fabrication of orthotic devices and a floor-type metal cutting shear facilitates this type of work. A separate workbench for the prosthetist and the orthotist is desirable although one workbench for both specialists would suffice in a minimum facility since their clinics are usually scheduled for different times.

Workbenches should be 30 inches by 72 inches with open tool racks above, drawers and enclosed shelves below. The vises and anvil should be located on the workbenches approximately as indicated in the plan. It is essential that a minimum clearance of 3 feet be provided from each end of the workbenches to permit working on appliances in the vises. This plan also includes a foot-operated

patching machine and a heavy-duty sewing machine with a flat bed. (Separate machines are preferable to the combination patching and heavy-duty sewing machine with removable flat bed.)

Plaster bandages are generally used to make negative casts of stumps. Positive casts are usually made in commercial shops. It is desirable, however, to provide facilities for the use of powder plaster in the shop. In addition, a variety of small items including hand tools used by the prosthetist and the orthotist would be required.

In limited programs, it may be necessary to omit some of the features included in the type "A" plan and provide minimum facilities as indicated in type "B" plan. For this type of program, the following revisions are recommended in the shop

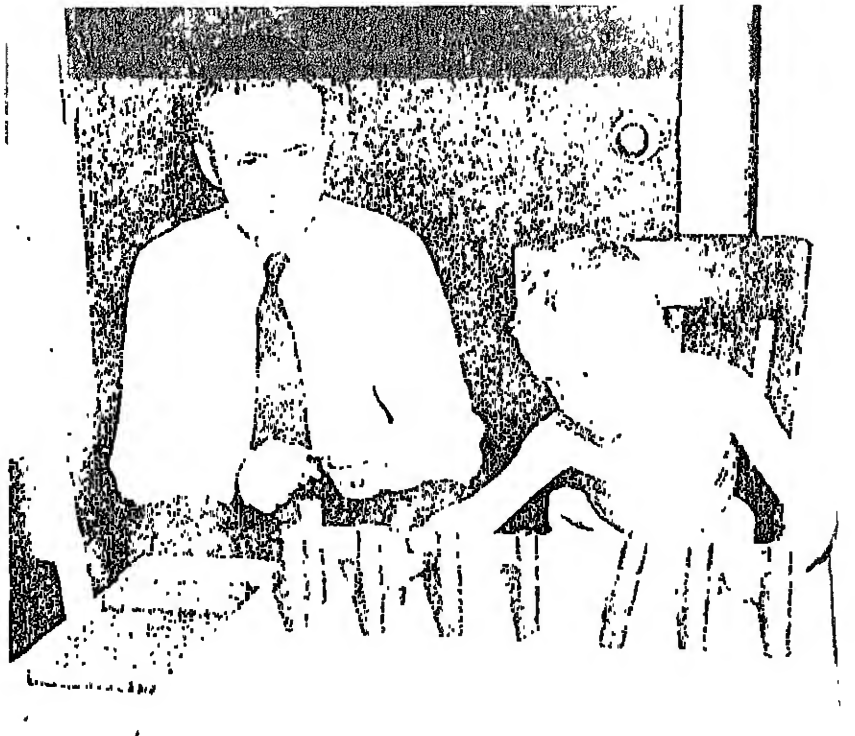
#### EQUIPMENT LIST FOR ARTIFICIAL APPLIANCE FACILITIES

1. Counter with plaster bins and drawers below
2. Chair with arms
3. Waste paper receptacle
4.  $\frac{3}{4}$ -h.p. pedestal-type buffer and grinder
5. Straight chair
6. 14-inch floor-type drill press
7. 14-inch wood and metal cutting band saw
8. Stool
9. Workbench, 30 inches by 72 inches, wood top,  $2\frac{1}{2}$  inches thick, open tool racks above, drawers and enclosed shelves below
10. Limb vise
11. 50-lb. blacksmith's anvil
12.  $4\frac{1}{2}$ -inch heavy-duty swivel vise
13. Lavatory with plaster trap below and medicine cabinet above
14. Hook strip
15. Desk with drawers, 20 inches by 36 inches, 30 inches high
16. Treatment table, 24 inches by 72 inches, 31 inches high
17. Curtain rod and curtain
18. Counter with drawers and enclosed shelving below
19. Shelving
20. Foot-operated patching machine
21. Heavy-duty sewing machine with flat bed
22. 9-inch screw cutting metal lathe with 42-inch bed, on bench with drawers and enclosed shelves below
23. Metal cutting shears, floor type
24. Telephone outlet
25. Combination patching and heavy-duty sewing machine with removable flat bed
26. Sliding doors
27. Electric outlet, floor type

requirements suggested in the equipment list:

- Omit the 9-inch screw cutting metal lathe, the floor-type metal cutting shear, one workbench and stool, one  $4\frac{1}{2}$ -inch heavy-duty swivel-type vise, the foot-operated patching machine and chair, and the heavy-duty sewing machine with flat bed.
- Provide a  $4\frac{1}{2}$ -inch heavy-duty swivel-type limb vise; a 50-pound blacksmith's anvil (on one bench for both specialists as indicated in plan "B"); and a combination patching and heavy-duty sewing machine with removable flat bed.





**Fitting Booth**—At least one fitting booth is recommended for the convenience and privacy of the patient during such procedures as taking measurements and making tracings of the stump and fitting or removal of the prosthesis or brace. The booth should be directly accessible from the shop and must be large enough to permit the movement of patients in wheelchairs and stretchers. A table with a firm, upholstered top similar to the treatment tables used in the physical therapy unit is recommended for taking measurements and making tracings of patients and for fitting and removal of some types of prostheses and braces. Work space should be provided on both sides and one end of this table.

The following equipment is recommended for the fitting booth: treatment table, 24 inches by 72 inches, 31 inches high; desk with drawers, 20 inches by 36 inches, 30 inches high; chair, with arms; and hook strip.

**Storage**—A storage room is recommended. Small drawers will be re-

quired for a variety of replacement parts and open shelves are needed for bulky supplies. The room can also be used to store appliances ready for fitting or being returned to the commercial shop for repairs of a major nature.

**Waiting Area**—A separate waiting area is not usually necessary for a minimum facility since patients can wait in a general waiting room and be supervised by the appointment clerk.

In some exceptional programs in which extensive research, teaching or specialized service are factors, more extensive facilities than those suggested may be needed. These programs require individual study as to requirements but most of the needs may be met by repeating the elements suggested for a minimum facility to the extent required by the program.

#### PSYCHOLOGICAL SERVICE FACILITIES

The role of the psychologist as an integral part of the rehabilitation team is a comparatively recent de-

velopment and some of the psychologists' traditional tools are being re-evaluated in terms of the needs of the physically handicapped. The success in this field to date promises even greater results to come with continued experience and research.

To the handicapped person who is uncertain of his ability to cope with the physical world, of his acceptance socially, and of his value as a person, psychological adjustment may be more difficult to achieve than the alleviation of his physical disability. The services of the psychologist can augment and contribute to psychiatric and social service techniques, which are directed toward helping the patient adjust himself realistically to the limitations imposed by his disability and to modify his concept of himself, his relations with people and his work accordingly. To this end, the work of the psychologist includes psycho-diagnostic testing, counseling, training, and research. Psychodiagnostic testing comprises the administration and interpretation of tests designed to measure the patient's intelligence, aptitudes and interest, and to assay the various components of his personality structure.

This work requires a calm setting and a location in a quiet area is essential. A location near the offices of the physician, medical social service worker and vocational counselor facilitates coordination with these services.

The psychologist's office should be not less than 10 feet square and preferably larger. The work done here does not imply any specific design requirements aside from the storage space for test material and books and the usual office equipment of desk and desk chair; two chairs with arms and a filing cabinet are generally provided.

#### MEDICAL SOCIAL SERVICE FACILITIES

The medical social service department of the hospital has an important role in the treatment of the rehabilitation patient whose medical needs are complicated by his social

situation. The medical social case worker studies the patient's personality, social situation, interests, and needs in relation to his disability. The medical social diagnosis and treatment is coordinated with the medical, psychological, and vocational services of the hospital.

The facilities for this department are provided in the administrative area of the hospital. However, at least one consultation office is desirable in the rehabilitation area. It should be in a quiet location conducive to serious discussion of personal problems and easily accessible to the patient and his family as well as to the physician and other professional personnel.

An office is required for each worker. The office should be brightly decorated, at least 10 feet square, and comfortably furnished. The equip-

ment usually includes a desk with drawers, desk chair, two chairs with arms, and a filing cabinet.

#### VOCATIONAL FACILITIES

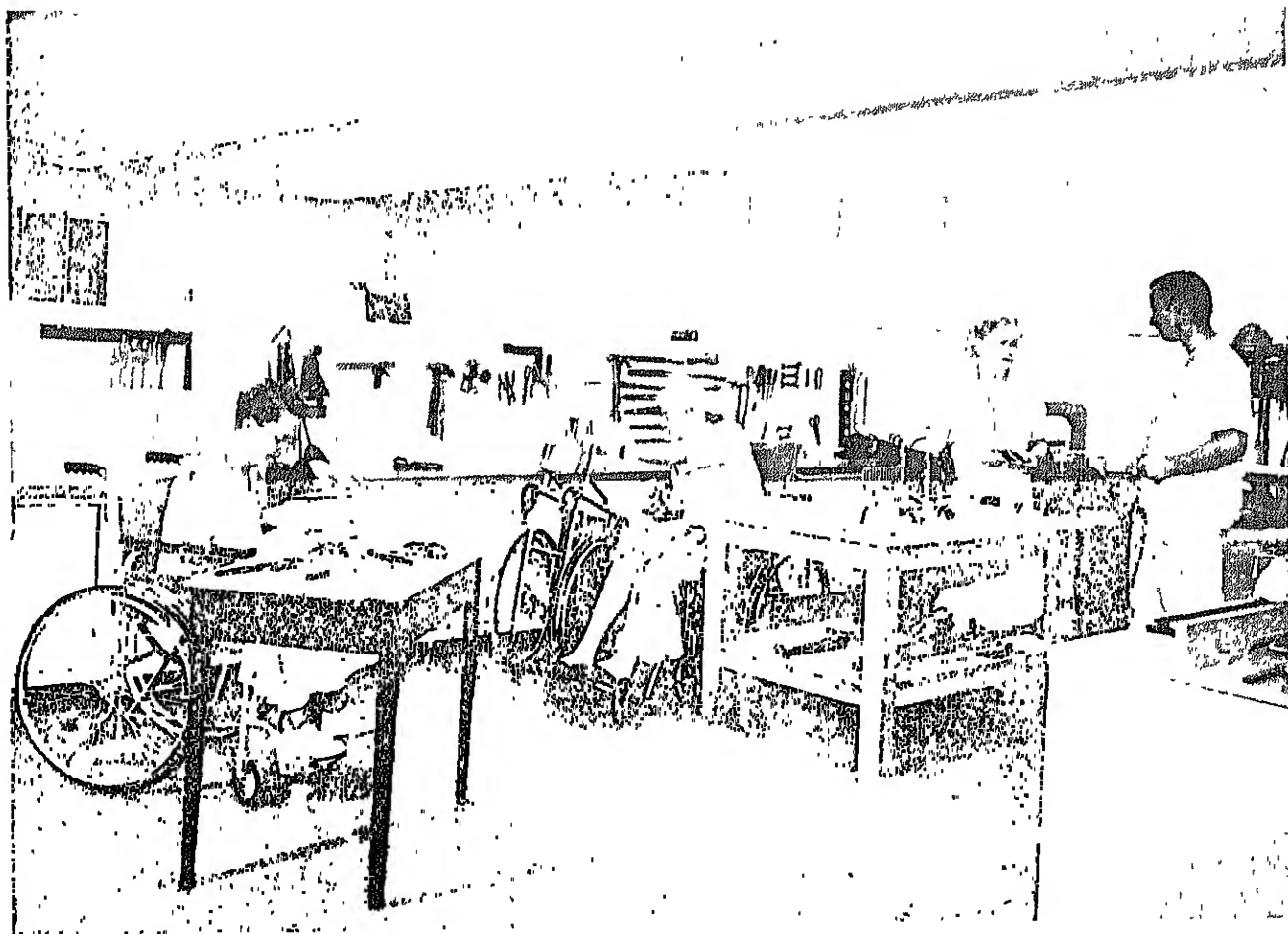
The ultimate goal of the handicapped person is to return to the community as an effective, contributing member. For many, proper job placement is the means for attaining this objective and to this end the medical, psychological, social, and vocational services cooperate in developing an occupational goal for the patient. If there are serious residual physical limitations, the goal may have to be restricted to a sheltered workshop activity or some form of home work. It could be self-employment in a small local business or part-time work under regular employment

conditions or, preferably, return to regular competitive employment. In some cases, of course, the patient will not be capable of any gainful occupation

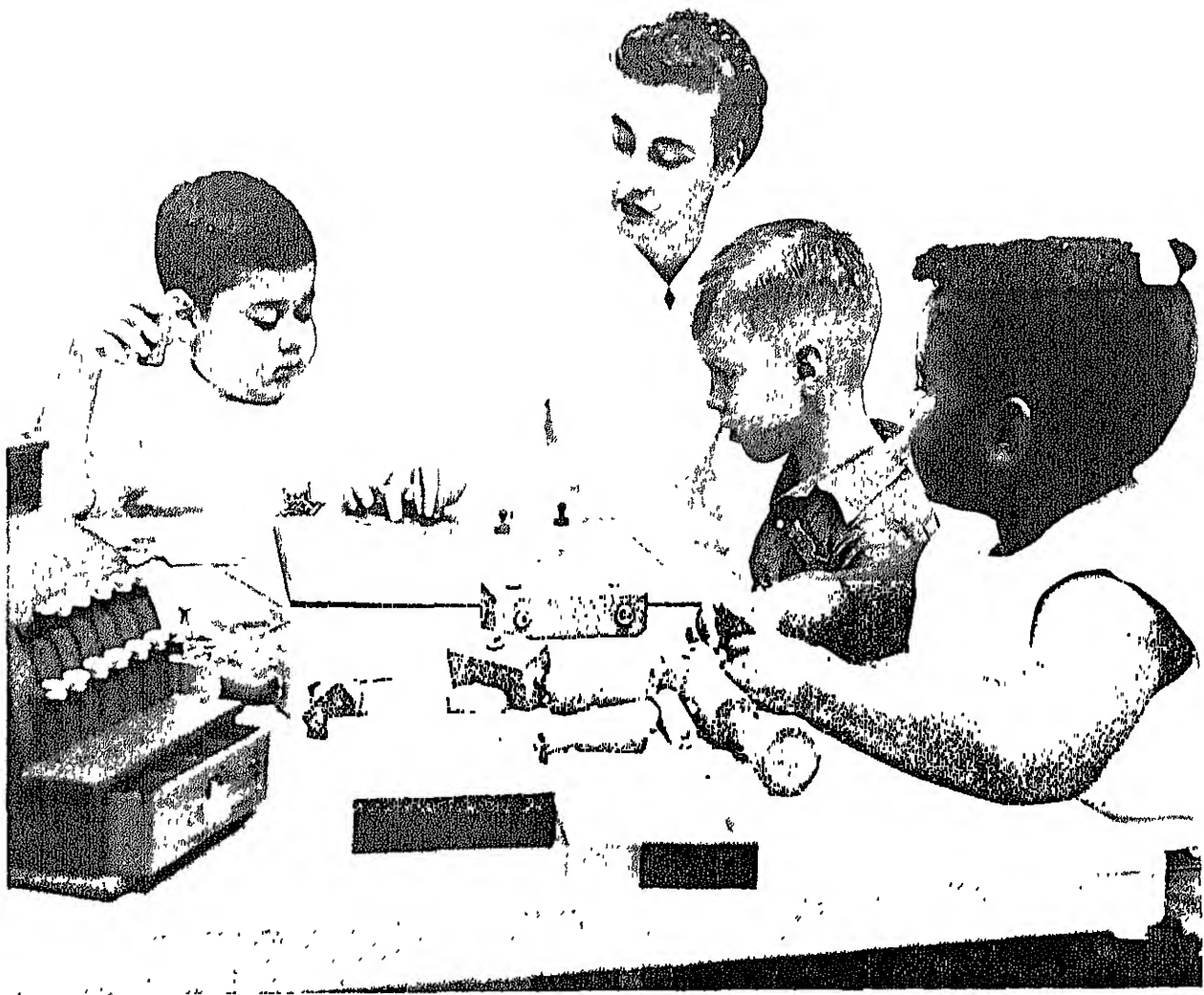
#### Prevocational Unit

A prevocational training program to assist in the determination of a realistic vocational goal for the patient is developed on the basis of the medical aspects of his problem, his abilities, including trainability, his interests and aptitudes. The prevocational period is one of evaluation or reevaluation rather than formal vocational training.

To determine the patient's potentialities, he must have access to a variety of work experiences. Actual working situations within the hos-







pital, rehabilitation facility, or community may be utilized but an organized program of work experiences provided in a prevocational unit produces more satisfactory results. These activities may include clerical work, skilled and semiskilled occupations, service occupations, and subprofessional occupations.

The accompanying plans show a prevocational unit which separates the noisy, dusty activities from the clean and comparatively quiet work. One room contains the woodworking benches, saws, drill grinder, and planes. The other room contains art tables, electrical bench, sewing ma-

chine, typewriter, and watchmaking benches. An office for the supervisor and storage area for tools and general supplies completes the unit.

The area required for the unit will vary with the extent of the prevocational program contemplated. This plan contains 1,000 square feet which is considered desirable for an extensive program.

In addition to prevocational training, vocational services include counseling, vocational training, referral, placement, and follow-up. Office facilities for a vocational counselor are required. On the accompanying plan, an office for vocational services has

been provided adjacent to the outpatient entrance.

The Office of Vocational Rehabilitation, U.S. Department of Health, Education, and Welfare, offers a manual on the prevocational unit in a rehabilitation center which contains much valuable information on all aspects of the prevocational service.

#### Special Education

Educational services are an essential part of a rehabilitation program that includes children, for unless opportunity is provided for intellectual growth, a degeneration of the entire

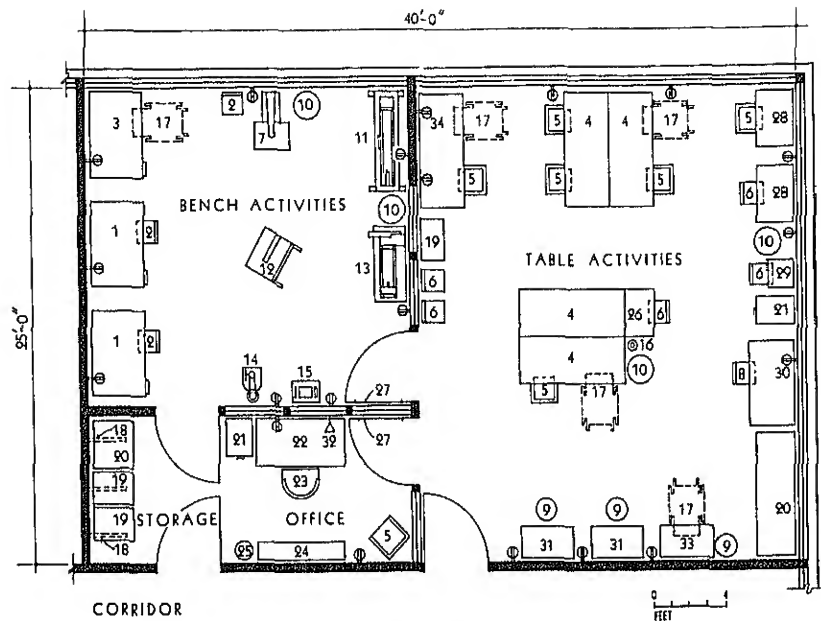
# EQUIPMENT LIST FOR PREVOCATIONAL UNIT PLAN

1. Woodworking bench with vise
2. Adjustable height swivel chair
3. Woodworking bench with vise for patient in wheelchair.
4. Flat-top wood table
5. Chair with arms
6. Straight chair
7. Electric jig saw
8. Posture chair
9. Stool
10. Waste receptacle
11. Woodworking lathe
12. Eight-inch tilting arbor power saw
13. Metal lathe on bench
14. Floor model drill press
15. Pedestal type grinder
16. Electric outlet, floor type
17. Wheelchair
18. Wall bracket above cabinets
19. Tool storage cabinet
20. General storage cabinet
21. File cabinet
22. Desk with drawers
23. Swivel chair arms
24. Bookcase with adjustable shelves
25. Waste paper receptacle
26. Electric sewing machine
27. Door, upper panel clear wire glass
28. Tilt-top art table
29. Typewriter stand
30. Typewriter desk with drawers
31. Watchmaker's bench
32. Telephone outlet
33. Watchmaker's bench for patient in wheelchair
34. Electrical testing bench for patients in wheelchair

personality of the patient can set in.

Special education in rehabilitation is aimed at the specific educational needs of the child with defective vision, hearing or speech, of the mentally deficient or gifted child and the emotionally disturbed child undergoing treatment for a physical disability. The service is usually provided by the municipality as part of the public educational system.

At least one classroom is needed, and the group hearing and speech



PLAN FOR PREVOCATIONAL UNITS

room and occupational therapy room for children can be used on a part-time basis as the need arises. The number of students in a class varies with age, previous training, and extent of disability. Small classes are the rule because of the need for individual attention; a desirable ratio is 10 students to 1 teacher. Fifteen students to one teacher is about the uppermost limit.

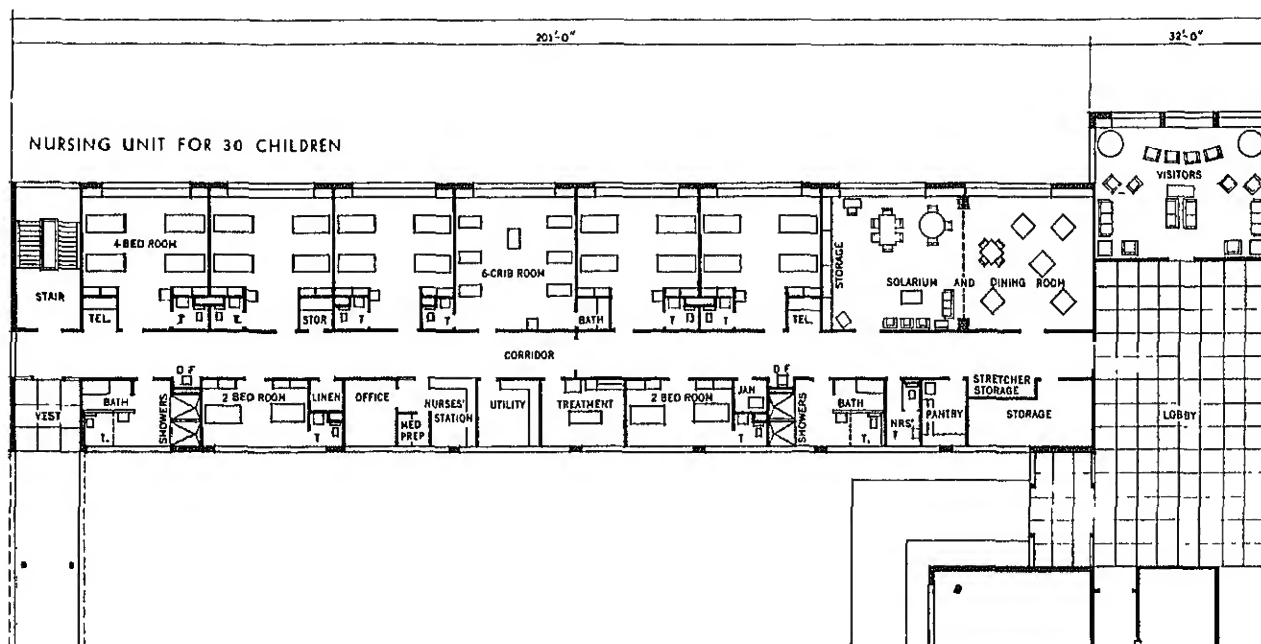
The classroom should provide an environment for the child that aids his intellectual development as well as his physical, social, emotional and personal well-being. Good auditory, visual, thermal, and space conditions, including imaginative use of color, are essential.

The floor area requirements are greater than in the normal classroom and may be as high as 40 to 50 square feet per student. The increased area is needed to accommodate children in wheelchairs or on crutches, to permit flexibility in seating, and provide space for special equipment.

The number, type, and size of chairs and tables to be provided vary with the age and type of patient and the extent of his disability. Although standard equipment is suitable for many students, some specially designed equipment will be required for specific patient needs. Adjustable height chalkboards to accommodate varying age groups are desirable and a knee space below permits convenient use by children in wheelchairs.

The use of handrails in classrooms is not recommended. Storage space for books and supplies must be provided. Finally, direct access to the outside is desirable to facilitate outdoor class activities.

Toilet facilities large enough to accommodate children in wheelchairs must be nearby. Drinking fountains should be easily available. Construction details applicable to the classroom including wainscots, window sills, thresholds, and finishes are included in another section of this material.



# INPATIENT FACILITIES

## ESTIMATING REQUIREMENTS

The administration of physical medicine and rehabilitation services in general hospitals varies. In some hospitals, patients are transferred to a rehabilitation nursing unit for an intensive program. In other hospitals, the patients are not transferred to a rehabilitation unit but remain under the management of the medical, surgical, orthopedic, pediatric, or neuropsychiatric service

tates more effective and efficient care. Requirements for the housing of rehabilitation inpatients differ considerably from those of other patients in the general hospital. Separate units, specially designed for these needs, are therefore recommended.

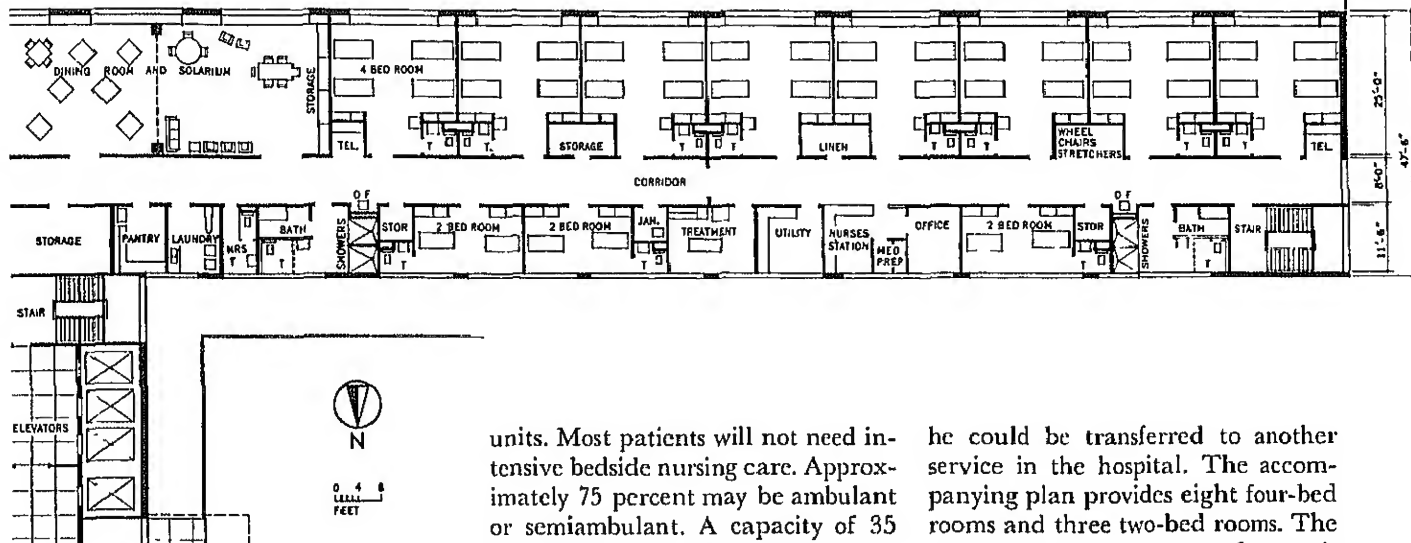
It is estimated that 75 percent of these patients will be ambulatory. Many of them get around on canes, crutches, wheelchairs and wheelstretchers. Such traffic requires greater clearances in bedrooms, day rooms, toilet rooms, etc., and wider doors.

Although the length of stay of individual patients will vary considerably, the average length of stay is estimated to be approximately 60 days. The psychological needs of long-term patients should be consid-

ered in the general approach to the design of this unit. A sombre institutional character should be avoided.

Data are limited on which to base an estimate of the number of beds in a large general hospital which should be allocated to the department of physical medicine and rehabilitation. It has been variously estimated that between 5 to 20 percent of the total number of beds of a large general hospital should be provided for this service. The attitude of the medical staff of the hospital toward this service must be considered in determining the bed capacity since a separate department of physical medicine and rehabilitation may be a new organizational unit of the hospital.

The accompanying suggested plans



for physical medicine and rehabilitation nursing units depict an adult unit of 38 beds and a children's unit of 24 beds and 6 cribs.

## NURSING UNIT FOR ADULTS

### CLASSIFICATION OF PATIENTS

The majority of patients with rehabilitation problems will be medically classified as orthopedic, traumatic, arthritic, cardiac, vascular or neurologic.

Separation by sex, by age, and types must be provided for here as in other units in the general hospital. Patients should be grouped also according to their physical and psychological requirements. Separate central bathroom facilities are needed, but for the rest, separation may be achieved by room assignments.

In the determination of the bed capacity of the nursing unit, consideration should be given to such factors as medical care practices and kinds and frequency of treatment. The number of beds in each unit may be greater than that usually recommended for medical and surgical

units. Most patients will not need intensive bedside nursing care. Approximately 75 percent may be ambulant or semiambulant. A capacity of 35 to 40 beds is recommended for economy and convenience in operation; 50 beds appears to be the maximum. The accompanying plan depicts a unit of 38 beds. The total area of the unit is 11,540 square feet or 304 square feet per bed.

### PATIENT ROOMS

In general medical and surgical units, the need for flexibility has resulted in the use of more single and two-bed rooms. In contrast to this, the requirements of rehabilitation patients appear to be best met with four-bed rooms. Social contact and opportunity to observe the progress of their roommates in bed exercises and other activities of daily living which are taught in the bedrooms have a stimulating and therapeutic value for those who are struggling with their own problems. The competition which arises in such a group benefits the general morale and patients encourage and assist each other. Finally, the therapists' time is more efficiently utilized.

Approximately one-fifth of the beds should be in two-bed rooms, for the occasional use of a patient in need of a period of orientation or a patient with a personality problem. An extremely sick patient would also be assigned to a two-bed room until

he could be transferred to another service in the hospital. The accompanying plan provides eight four-bed rooms and three two-bed rooms. The room area for each type of room is 130 square feet per bed including the adjacent toilets.

### TYPICAL FOUR-BED ROOMS

More space is required for rooms in this unit than is usually provided in general medical and surgical units. This additional area is necessary to permit free movement of patients on canes, crutches, wheelchairs and wheel stretchers. Beds should be placed at least 4 feet apart and a minimum of 3 feet is required between a bed and an adjacent wall, wardrobe, etc. Doors to patients' rooms should be 3 feet 10 inches wide and should swing into the room.

Patients' beds should be of the variable height type. (Beds should be adjusted so that when the patient is sitting on the side of the bed his feet will be firmly on the floor.) The bed must not move while the patient is getting in or out or practicing bed exercises. Rubber cups or other suitable devices should be used to prevent any movement; caster locks are not satisfactory. The headboard should preferably be of the vertical rail type rather than flush so that by grasping the rails, the patient can help himself in maneuvering his body about the bed.

Wall brackets adjacent to patients'

beds are required for storage of canes, braces, and crutches. This arrangement promotes self care and eliminates the hazards inherent in placing these items on the floor.

Double pedestal type overbed tables are preferred for rehabilitation patients because they offer more support than the single pedestal type and should be provided for all beds in this unit.

A standard enclosed bedside table should be satisfactory.

One straight chair with arms should be provided for each bed. Deep easy chairs should be avoided in patients' rooms since many types of rehabilitation patients cannot get out of an easy chair unaided. However, easy chairs should be provided in other areas for training.

Cubicle curtains and tracks should be sturdy enough to support patients who occasionally hold on to the curtains to maintain their balance. Curtain tracks flush with the ceiling are preferred. Where so installed the curtains should have open, or perforated, panels at the top for ventilation when curtains are drawn.

Patients in this unit are up and active for a large part of their stay in the facility. They have a tendency to accumulate personal possessions. To provide for their clothing and other possessions, ample storage space adjacent to the beds is required. Locker space should be a minimum of 30 inches wide and 18 inches deep. Clothes rods and shelves should be adjustable for the convenience of patients in wheelchairs. Sliding doors

(with locks) are desirable on the lockers. Additional drawer and shelf space should be provided

#### TWO-BED ROOMS

Details of two-bed rooms will be similar to those of four-bed rooms.

#### TOILET FACILITIES

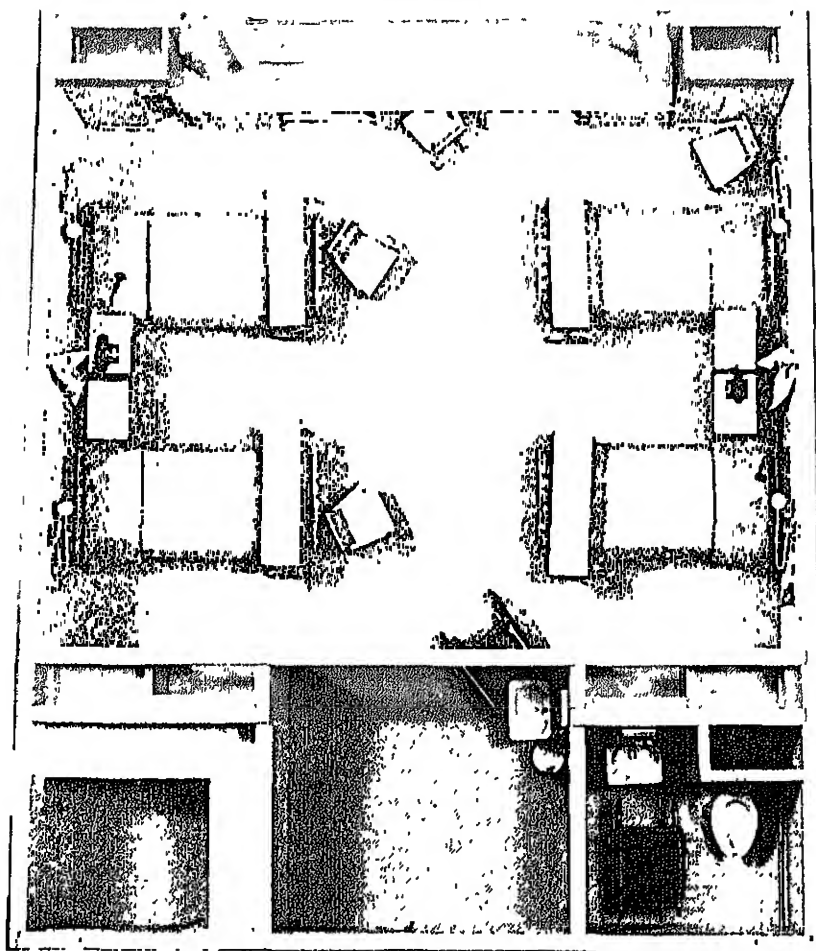
Toilet facilities adjacent to patients' rooms should be provided for the convenience of both patients and staff. The advantages of such accessibility for physical medicine and rehabilitation patients are most important: the patient is encouraged to use the toilet during the early stages of his ambulation; bladder and bowel training is easier for the patient with accompanying timesaving and convenience for nurses and attendants; bedpan and urinal handling is easier.

The toilet room shown on the plan is based on an actual installation now in use at a rehabilitation facility. After an experience of several years, both patients and staff approve the arrangement as a practical solution to a difficult problem. The area indicated is considered a minimum for the easy movement of wheelchairs. The water closet should be located so that the patient can approach it from front or side.

The continuous grab bar on the wall adjacent to the side of the water closet is essential for some patients in maneuvering on and off the wheelchair. Continuous grab bars are recommended on both sides of toilet rooms or stalls that are not of sufficient width to permit a side approach to the water closet. A metal bar, 1½ inches in diameter, installed 2 feet 6 inches above the floor, is recommended.

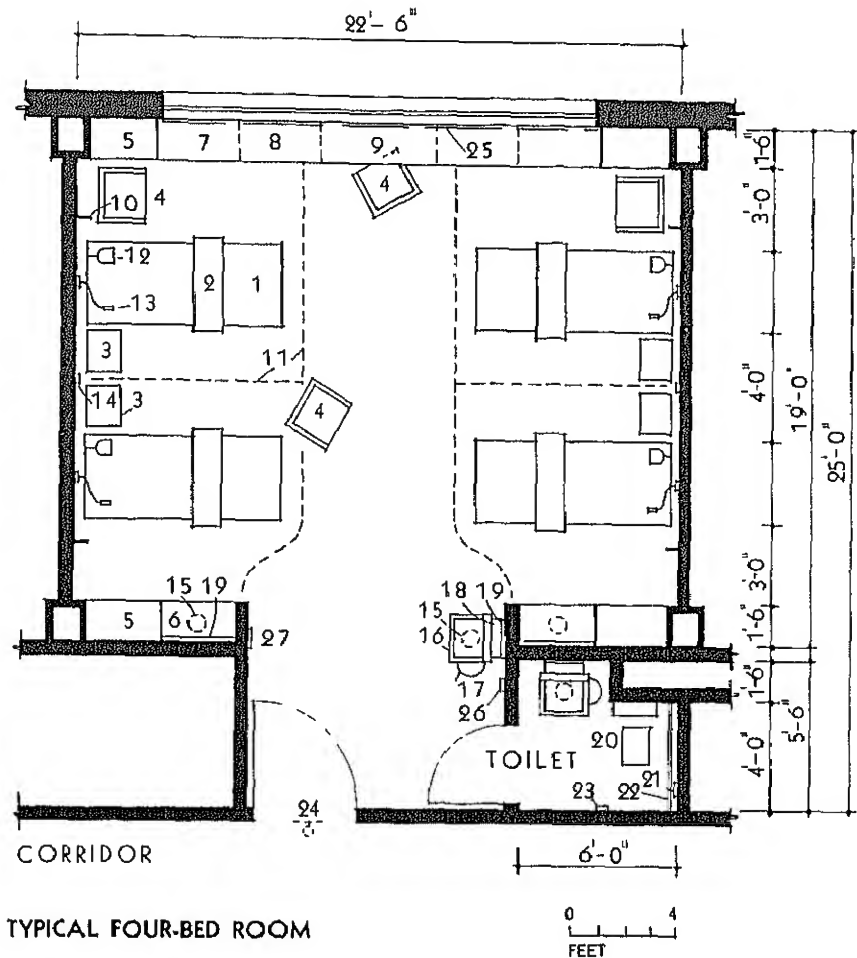
Teaching patients to transfer from wheelchair to water closet unassisted is an important part in the rehabilitation of some types of disabled patients. Toilets or toilet stalls of sufficient size to permit this type of training should be provided. Space is required in front and at least on one side of the water closet for the move-

FOUR-BED ROOM



**EQUIPMENT LIST FOR PLANS OF TYPICAL  
FOUR-BED ROOM AND TOILET FACILITIES**

1. High-low hospital bed
2. Over-bed table
3. Bedside table
4. Arm chair
5. Built-in locker
6. Built-in dresser
7. Drawers below window sill
8. Shelves below window sill
9. Open below window sill
10. Wall bracket for braces and crutches
11. Cubicle curtain
12. Bed light
13. Nurses' calling station
14. Telephone outlet duplex receptacle and 1 phase, 3 wire, 20 amp., 125 v. receptacle
15. Wall bracket light, switch controlled
16. Lavatory with gooseneck spout and hot and cold water controls
17. Waste paper receptacle
18. Shelf
19. Mirror
20. Water closet with bedpan lugs and bedpan flushing attachment
21. Continuous grab bar
22. Paper holder
23. Nurses' calling station (push button type)
24. Corridor dome light
25. Sliding window curtain
26. Duplex receptacle
27. Night light, switch controlled
28. Bathtub
29. Curtain
30. Vertical handrails

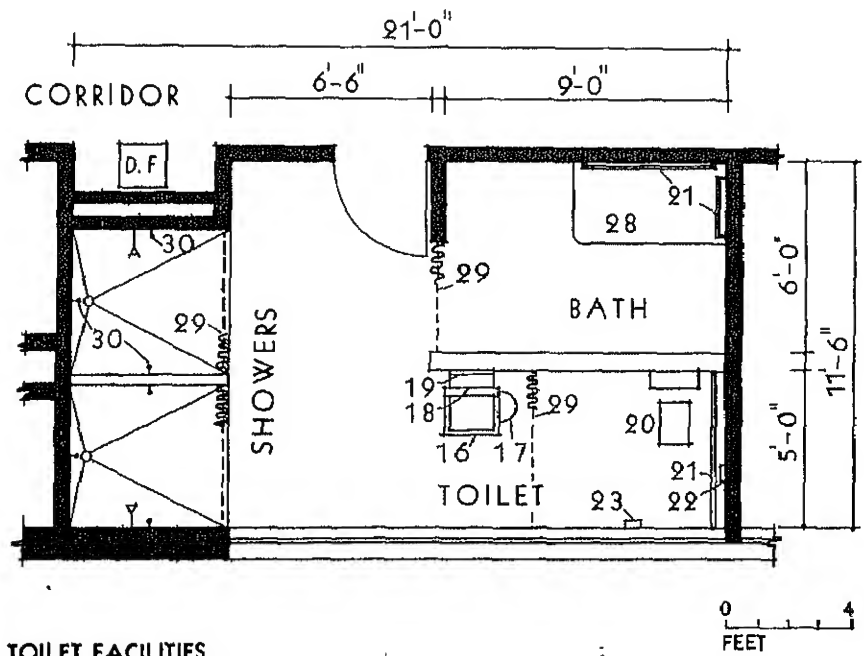


**TYPICAL FOUR-BED ROOM**

ment of the wheelchair and instructor. A minimum of 5 feet wide and 6 feet deep is recommended. A separate training toilet for each sex should be provided if the toilets adjacent to patients' rooms are not large enough.

If centralized toilets are provided, a toilet room for each sex at a ratio of one water closet to each five beds is recommended as a minimum. At least one water closet enclosure in each toilet room should be large enough to permit toilet training.

A toilet door should be 36 inches wide with a metal kick plate on each side and should swing out. An in-swinging door could be blocked if the patient should meet with some accident inside the toilet room and fall in front of the door.



**TOILET FACILITIES**

The lavatory in the toilet room is provided to encourage self-care and personal hygiene. Because the toilet can be occupied for protracted periods, a lavatory in the bedroom is also recommended. For the convenience of wheelchair patients, lavatories should set out on wall brackets 6 inches from the wall and 2 feet 10 inches from the floor. Wall connected water and drain piping will leave the space below the lavatories clear and increase accessibility for patients in wheelchairs. Gooseneck spout and blade handle controls are desirable.

The temperature of the hot water provided at fixtures which are used by patients should be thermostatically controlled to provide a maximum of 110° F.

#### BATHING FACILITIES

A bathroom should be located at each end of the unit, as it is desirable to separate inpatient accommodations for men and women as much as feasible. Two showers and one tub have been provided for each sex. A ratio of one to eight for showers and one tub for each sex is considered minimum. A toilet stall has also been provided in each bathroom for the convenience of patients using the room or patients from rooms whose adjoining toilets are occupied.

Showers should be about 4 feet square and should have handrails and curtains. Vertical handrails located in the center of each wall have proven satisfactory. They should be metal, 1½ inches in diameter and 2 feet long with the bottom of the rail placed 3 feet from the floor. One of the showers in each room may have a seat with arms for those patients who must use a seated position. The seat may be hinged to the shower partition and pivoted to permit a change of position in the shower. The floors of the stall and room should

tendant and to permit regulation prior to use.

Bathtubs should be set on the floor as they would be in a normal environment, with one side and one end of the tub against a wall and one side and one end accessible. Patients generally find more security in this arrangement than when three sides of the tub are accessible. Sufficient clearance should be allowed at the end and side of the tub for the maneuvering of wheelchairs. A handrail should be provided on the wall for the full length of the tub. The handrail may be of metal, 1¼ inches in diameter, installed 2 feet 6 inches above the floor and securely fastened to the wall at the ends and in the middle.

Self-help equipment used for toilet and bathing activities such as seats, benches, tubs, mats, etc., are available commercially.

#### DAY ROOM

Recreation is a very important part of the total program and a generous space should be allocated for it. It is recommended that a minimum of 25 square feet per bed for 75 percent (estimated percentage of ambulant patients) of the beds in the unit be provided for the day room. Typical living room furniture may be used, providing sufficient straight chairs with arms are included. Storage space for equipment is required in or adjacent to the day room.

#### DINING ROOM

Dining under normal conditions is an important part of the treatment for these patients, and a dining room separate from the day room is desirable. It is recommended that a minimum of 25 square feet per bed for 75 percent of the beds in the unit be allocated for the dining room. Tables of metal type, with sufficient clearance between the bottom of the table and the floor for the maneuvering of wheelchairs, are needed. They must

To protect other patients from noise, the day room and dining room should be located at the entrance to the patient area. This location would also be desirable for the serving of meals and reception of visitors since it would eliminate that traffic from the patient corridor. Acoustical treatment of these areas would be required.

On the nursing unit plan, the day room and dining room have been located adjacent to each other and separated by a folding type partition making the combined areas available for movies and other social activities.

The floor pantry should be next to the dining area. The size of the room and necessary equipment will be determined by the type of food service selected.

#### WHEELCHAIR AND WHEELSTRETCHER STORAGE

The areas and clearances in patients' bedrooms shown on the plan are sufficient to permit the patients to keep their wheelchairs in their rooms. This is considered necessary as the wheelchair is essential equipment for many rehabilitation patients and must be readily accessible to them at all times. The arrangement also saves the staff many steps. The storage space provided in the corridor is for wheelchairs not in use and for stretchers.

#### GENERAL STORAGE

General space is essential for storage of items common to nursing units and rehabilitation equipment, many of which are bulky.

#### PATIENTS' LAUNDRY ROOM

A laundry room equipped for washing, drying and ironing of personal clothing by patients is recommended since these patients wear their own clothing and are in the unit for long periods of time. Laundering is one of the routines of daily living which may be taught to some patients. The laundry equipment should be provided in residential type units.



## OTHER SERVICE AREAS

The nurses' station, utility room, treatment room, etc., will be similar to those found in general medical and surgical nursing units.

## NURSING UNIT FOR CHILDREN

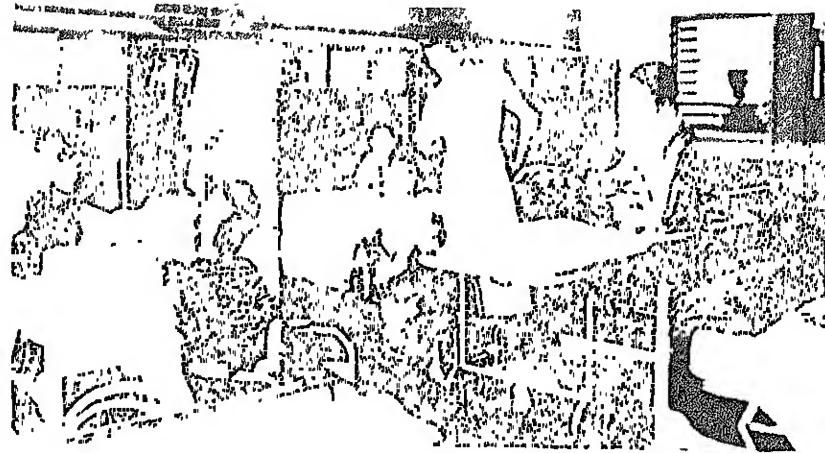
The provision of a facility for children within the department of physical medicine and rehabilitation has an advantage over isolated facilities devoted exclusively to the provision of rehabilitation services for children. The former provides direct access to the other essential medical services available in the hospital. A separate facility for children usually lacks such access to these medical services. Inclusion of such a facility for children within the department of physical medicine and rehabilitation in no way impairs the function of the department; in fact, the reverse is true. Better medical services are offered and on a more sound, economic basis. However, in the case of inpatient facilities, experience has shown that because of medical, psychological, physical and administrative considerations, it is essential to separate children's facilities from those of adults. The general principles and planning details discussed in the adult unit section apply equally to accommodations for children unless noted otherwise.

### CLASSIFICATION OF PATIENTS

The majority of children in this facility will require rehabilitation because of orthopedic conditions, congenital malformations, disabilities following injuries, post-infantile paralysis and other neurological conditions.

### AGE GROUP

It is generally recommended that the maximal age of children in this unit be 14 years. (The adolescent is in an age group with special problems which make hospital care difficult in either a children's or an adult's



unit. Since it is usually impractical to provide a separate unit for this age group, children over 14 years are, as a rule, assigned to the adult unit.)

### BED CAPACITY

Lack of reliable data makes it impractical to recommend a ratio of children's beds to adult beds. Determining factors include size and characteristics of the area to be served, administrative policy of the hospital regarding transfer of patients to this service and the establishment of the age limit of children to be assigned to the unit. Thirty beds, including cribs, are recommended as the maximum bed capacity of a children's unit. The capacity shown on the accompanying plan is 24 beds and 6 cribs. The total area of this unit is 9,180 square feet or 306 square feet per bed, including cribs.

### PATIENT ROOMS

It is suggested that separate rooms be provided for the following:

- (1) Crib patients, male and female.
- (2) Junior patients, male and female, 5 to 8 years of age inclusive.
- (3) Patients, 9 to 14 years of age, male.
- (4) Patients, 9 to 14 years of age, female.
- (5) Isolation.

The nursing unit plan includes one room for six cribs, five four-bed rooms for junior and teenage patients and two two-bed rooms. Six cribs in the room are considered maximum and this room should be located near the nurses' station. Four-bed rooms, similar to the adult patient rooms, are recommended for junior and teenage patients in place of larger wards. These permit more flexibility in assignment of beds and tend to reduce some of the behavior problems found in larger rooms.

As in the adult unit, the two-bed room will be used occasionally by a patient in need of a period of orientation, by one with a personality problem, or by an extremely sick patient until he can be transferred to another service. The presence of the two-bed room also makes it convenient for a parent to stay with a patient where such an arrangement is permitted. A minimum of two two-bed rooms per nursing visit is recommended.

With the exception of the crib room, a generous wardrobe space should be provided for each bed. The plan indicates a wardrobe adjacent to each bed and additional storage space for toys and games below the window sill. Chairs and tables in patient rooms and the other areas used by patients should be in scale with various age groups.

#### TOILET AND BATHING FACILITIES

It is recommended that standard size water closet fixtures be installed in the children's unit and that toilet seat adaptors and footstools be available for small children. Although baby and junior size fixtures would

be more convenient for small children, training in the use of standard equipment found in a child's home environment would be part of the program. This arrangement also provides maximum flexibility in room assignment of the various age groups.

The accompanying plan provides two showers and one tub for each sex for a ratio of 1 to 6 showers and 1 to 12 for tubs, excluding crib patients. One additional bath is indicated adjacent to the crib room for the convenience of the nurse in bathing crib patients.

## GENERAL REQUIREMENTS

#### DESIGN DETAILS

Space allowances in all areas used by rehabilitation patients should be generous to provide the extra maneuvering room needed by patients on crutches, wheelchairs, and wheelstretchers. Doors which patients will use should be not less than 3 feet 8 inches wide; they should not swing into corridors. All thresholds should be flush with the floor.

Window sill heights in patient activity rooms should be well below the eye level of patients in wheelchairs. Whenever possible, steps and ramps should be avoided and exterior platforms at entrances should be at the same level as the floor inside. Non-slip masonry, comparable in finish to a sand float concrete finish, is recommended for exterior platforms. A neat cement or steel trowel finish should not be used.

Ceiling heights should be not less than 8 feet clear. Ceilings of boiler rooms, kitchens, and laundries should be well insulated to shield the floor directly above.

Otherwise, design details and equipment should be similar to those recommended for general hospitals.

#### CORRIDORS

Corridors in the evaluation and treatment area are subject to heavy

traffic of patients on crutches, wheelchairs, and wheelstretchers. A width of 8 feet is considered a satisfactory minimum with greater width provided at elevators. Handrails are not recommended for corridor walls because their use by the patient conflicts with the philosophy that he should not become dependent on aids not found in his normal environment.

#### DRINKING FOUNTAINS

Drinking fountains should be conveniently accessible for patients and staff. If placed in alcoves, the alcoves should be of sufficient size (3 feet 6 inches wide) to admit a wheelchair. The fixtures should project from the wall so that they may be used easily by a wheelchair patient approaching them from the front. They should be trimmed with angle stream bubbler and have both foot-operated and lever handle valves. The control valves should be self-closing and should operate by being depressed. The lever handle valves may be placed on both sides of the fountain or, if a single valve is used, it should be located for easy operation with either hand. The bubbler should be approximately 36 inches above the floor for adults and 26 inches above the floor to accommodate small children.

#### TELEPHONE ALCOVES

It is desirable to provide telephone facilities in this area for the convenience of patients. A location near the rehabilitation waiting area is recommended. Telephone alcoves should be designed for the convenience of patients in wheelchairs, wheelstretchers, and in standing position. A minimum of 4 feet square is a requirement. The telephone should be a handset phone located in the center of the rear wall on a continuous shelf 1 foot wide and 3 feet above the floor. Doors should be omitted; sound insulation is also required.

#### LOCKER, SHOWER, AND TOILET FACILITIES FOR PATIENTS

Locker facilities for storing outpatients' clothing and showers for cleaning up after strenuous exercise are essential. Also, patients' toilets should be provided near all treatment areas.

For complete flexibility of use by all types of patients, all toilet stalls should be large enough to accommodate patients in wheelchairs; where this is not possible, at least some of them should be so arranged. The minimum recommended size is 5 feet by 5 feet, and a curtain rather than a door at the stall entrance is recommended. To permit a side approach

to the water closet, it should be centered on a line 1 foot 6 inches from one wall of the stall. A continuous metal bar 1½ inches in diameter should be installed 2 feet 6 inches above the floor on the wall nearest to the water closet to help patient's maneuvering.

The smaller toilet stalls should be not less than 3 feet wide, with a curtain instead of a door and with no return at the front of the stall. Handrails should be provided on both sides of the stall. For the convenience of wheelchair patients, lavatories should set out on wall brackets 6 inches from the wall and 2 feet 10 inches from the floor. Water and drain piping should be wall-connected, which will leave the space below the lavatories clear and increase accessibility for patients in wheelchairs. A gooseneck spout for the lavatories is desirable.

Mirrors should be placed directly over the lavatories. Small mirrors should angle downward slightly for the convenience of patients in wheelchairs. However, the mirrors may be mounted flat against the wall providing they extend low enough for patients in wheelchairs as well as for those in a standing position.

Showers should be about 4 feet square and should have handrails and curtains. Flexibility in the use of showers can be provided through the installation of two shower heads in each stall, with the heads valved for independent use. One of the heads should be placed in a low position for the use of a seated patient; the other shower head can be located normally. Vertical handrails located in the center of each wall of the stall have proved satisfactory. Metal handrails 1½ inches in diameter and 2 feet long, the bottom of which should be located 3 feet from the floor, are recommended. The floors of shower stalls and adjacent areas should be flush and without an intervening curb, but may be slightly dished toward the drain.

Water at all fixtures which are used by patients should be thermostatically controlled to provide a temperature of not more than 110° F. at the tap.

Additional self-help equipment used for toilet and bathing activities such as seats and benches is available commercially. Emergency call buttons should be provided in all toilet rooms and bathrooms.

#### PATIENTS' SCALE

A scale for weighing patients should be provided in a convenient location within the evaluation and treatment area. The scale platform must be flush with the floor to avoid the obvious difficulties involved in its use by disabled patients.

#### LINEN FACILITIES

The extent and location of linen storage facilities will be determined by the patient load and the system of linen distribution. Since the thermotherapy massage and water treatment units use most of the linen, a clean linen closet is usually provided near these areas. Daily supplies, drawn from this closet, are distributed to the individual treatment booths and stored on shelves or in drawers under treatment tables.

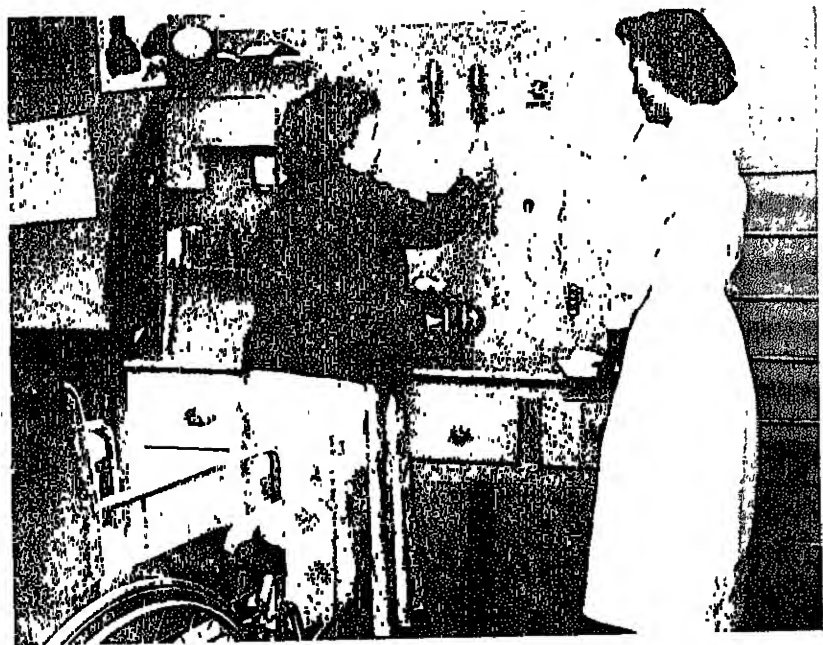
As it accumulates, soiled linen is placed in linen hampers located in the various treatment areas for later collection and dispatch to the laundry.

#### LUNCH FACILITIES

Outpatients on a full day schedule should be served lunch on the hospital premises to avoid the difficulty involved in their leaving the building. This service can be provided in the hospital cafeteria or dining room, but the extra load must be taken into account in determining the capacity of the dining areas.

#### INTERIOR FINISHES

The activity of patients on wheelchairs, wheelstretchers, and crutches will subject the floors and walls of the department to heavy wear. Materials which will stand up under such rough usage with a minimum of maintenance should be specified despite higher costs. A durable and attractive wainscot should be provided for all interior wall surfaces for protection against the damage caused by wheelchairs, wheelstretchers, and



carts Ceramic wall tile or glazed structural units will serve this purpose, but they emphasize the institutional character of the hospital. In patient areas this should be minimized if possible.

In the last several years vinyl wall covering has been gaining popularity as a wainscoting material, and to some extent for the entire wall. The heaviest weight vinyl material is usually used for wainscot areas such as corridors subject to severe abuse or heavy duty. A lighter weight vinyl is also used for wainscoting and will serve for most areas requiring protection. The lightest weight is used above the wainscoting in lieu of paint or other finish. It has high washability and is available in a variety of homelike patterns and color combinations.

The use of decorative colors for interior finishes and equipment is, of course, highly desirable in this department as it is in the rest of the hospital. Paint in patient areas (except toilets) should have a mat finish. Glossy finishes, including semi-gloss, are disturbing to many patients and contribute to the "institutional look."

Flooring materials in areas used by patients must be slip-resistant. In dry areas a resilient flooring material should be selected on the basis of its slip-resistant qualities and resistance to permanent indentation resulting from concentrated loads of equip-

ment. Heavy duty prepolished vinyl flooring has proven satisfactory.

Asphalt tile with an abrasive embedded in the surface to increase the slip-resistant factor is available. There is also a vinyl "carpet" installed over a sponge rubber underlay, which is reported to have a high coefficient of slip-resistance.

A hard tile floor with slip-resistant surface may be specified for toilet and wet areas.

For hydrotherapy rooms and similar large wet areas, quarry tile will provide as nearly a slip-proof floor as can be obtained with a hard water-proof material. Quarry tile is also available with an abrasive embedded in the surface which will increase its slip-resistant quality.

Other interior finishes should be similar to those for the general hospital.

#### AIR CONDITIONING

Air conditioning, which is becoming a standard installation in modern hospital practice, will be a necessity for certain areas of rehabilitation facilities in most sections of the country.

Ventilation for comfort of patients and personnel is required for the small treatment areas. In most instances the ultraviolet, infrared and short wave diathermy equipment make temperature control a necessity.

The reduction of humidity for comfort, protection of equipment,

and reduction of the hazard of slippery floors makes air conditioning vital in the hydrotherapy section.

Mental tranquility and alertness and physical comfort will be promoted by accurate temperature and humidity control in the exercise areas.

#### FIRE SAFETY

##### Fire Cutoff Doors

A pair of doors across the corridor at various locations on the plan serves to subdivide the building into a number of compartments in case of fire. These doors are normally kept open but are arranged to close automatically when released by the action of heat. They can also be readily closed manually.

##### Fire Extinguishers

Each compartment, as noted above, should be provided with not less than two units of fire extinguishers near its center. To avoid interference with corridor traffic, they should be set in a niche about 1 foot off the floor. No door or cover is required. Water type extinguishers are probably most effective for the majority of fires found here.

#### LIGHT SWITCHES

All switches in rooms used by patients should be of the toggle type.

## RESEARCH

to a varying degree, but extensive research can be conducted only in large medical centers which have the required competencies and facilities.

Although the entire hospital serves as a research area, such programs will

require separate facilities for basic research. The amount of space and kind of equipment needed varies with the program and can be determined only by consultation with the professional staff.

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Following is a list of health and welfare organizations from whom additional material and information on rehabilitation may be obtained:

American Association for the Advancement of Science,  
1515 Massachusetts Avenue, N.W.  
Washington 5, D. C.

American Physical Therapy Association,  
1790 Broadway  
New York 19, N. Y.

American Standards Association.  
10 East 40th Street  
New York 16, N.Y.

Institute for the Crippled and Disabled,  
400 First Avenue  
New York, N.Y.

International Society for the Welfare of Cripples,  
701 First Avenue  
New York 17, N.Y.

National Hospital for Speech Disorders  
61 Irving Place  
New York 3, N.Y.

National Society for Crippled Children and Adults, Inc.  
11 South LaSalle Street  
Chicago 3, Ill.

New York University-Bellevue Medical Center,  
Institute of Physical Medicine and Rehabilitation  
400 East 34th Street  
New York 16, N.Y.

U. S. Department of Health, Education, and Welfare  
Public Health Service  
Division of Hospital and Medical Facilities  
Washington 25, D. C.

U. S. Veterans Administration,  
Physical Medicine and Rehabilitation Services,  
Washington 25, D. C.

Volta Bureau (Hearing Handicapped),  
1537 35th Street, N.W.  
Washington 7, D. C.

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### Hill-Burton Publications

An annotated bibliography, "Hill-Burton Publications," Public Health Service Publication No. 930-G-3, will be provided upon request. For a free single copy, write to:

Division of Hospital and Medical Facilities  
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